



University of Toronto
Faculty of Arts and Science
St. George Campus

Calendar
1973-1974

KEY TO COURSE DESCRIPTIONS

This Calendar includes all courses that are expected to be offered in day classes during the winter session 1973-74. Although a few evening sections are shown, students wishing more detail on evening and summer courses are referred to the calendar entitled "Degree Programmes in Extension".

Courses are listed alphabetically by three-letter code ("designation") and three-digit number. The designation is normally an abbreviation for the department that offers the course: however, IN followed by a third letter other than D denotes an interdisciplinary course, and J a course offered jointly by two or more departments (e.g. JHP 343 means Joint History and Political Science). The first digit of the course number normally indicates the year of most of the students in the course: thus HIS 232 is designed primarily for second-year students although it is in fact open to students in all years.

If there is no suffix after the course number, the course is a full course given throughout the academic session. A suffix indicates a half-course or other variation:

F—a half-course given in the First (Fall) Term only

S—a half-course given in the Second (Spring) Term only

Y—a half-course given continuously throughout the whole academic year

A—a full course offered only in the First (Fall) Term

B—a full course offered only in the Second (Spring) Term

Z—a course not offered for credit towards a degree.

After the short title of the course the number of equivalent hours of formal instruction per week is given. L denotes lectures; S seminars; P practical work in laboratories or studios; T tutorials (normally lecture sections divided into small groups).

The days of the week are shown as MTWRF (R = Thursday)

N means timetable hours not yet specified

The solidus symbol (/) means OR

The comma (,) or the ampersand symbol (&) means AND.

When a course is given at more than one timetable hour section numbers are indicated. Thus for ANT 100 L1: TR12, L2: TR10 means that lecture section 1 meets Tuesday and Thursday at 12, and lecture section 2 Tuesday and Thursday at 10. When a letter occurs before the L/S/P/T it indicates that the section is designed primarily for (but not restricted to) students in the college indicated by the letter, if their timetable permits. I, M, N, T, U, V denote respectively Innis, St. Michael's, New, Trinity, University and Victoria Colleges. O indicates a section primarily for students in other faculties. Thus for CHM 120 OL1 means a section primarily for such students (in this case Pharmacy), NML2 means a section for New and St. Michael's College students. Notice in this case that there are also practicals and tutorials.

Sections given at the same time are not distinguished in the Calendar. In the case of certain College subjects (ENG, FRE, GER, GLL, GRH, GRK, LAT), there is a section taught in each teaching College at each hour unless a college prefix is shown. Thus in LAT 199 (a fictitious example) L1:TR10, UL2:TR11 would mean that each College teaches a section at 10 but only University College at 11. Where there is only one timetable hour in some cases not every College will be teaching the course. For such information students are referred to the Chairman of the College Department.

P76-0026 022



University of Toronto
Faculty of Arts and Science
St. George Campus

University College
Victoria College
Trinity College
St. Michael's College
New College
Innis College

Calendar
1973-1974

SCHEDULE OF DATES 1973-1974

Summer Session 1973

EVENING		DAY
April 1	Last date for new students, both regular and special, to apply for admission	May 15
April 15	Last date to register without late fee	June 1
May 1	After this date, registration will not be permitted	June 15
May 14	Classes begin	July 3
May 21	Victoria Day (Classes cancelled)	—
June 1	Last date to submit requests to transfer to full-time studies for winter session 1973-74	June 1
July 2	Dominion Day observance (Classes cancelled)	—
July 10	Last date for students with supplemental privileges to apply to write the August examinations	July 10
August 6	Civic Holiday (Classes cancelled)	August 6
August 10	Last day of classes	August 10
August 13-17	August examinations	August 13-17

Winter Day Session 1973-1974

1973

April 19	Last date for return of applications for admission scholarships	
June 1	Last date for receipt of the following applications: —admission of new Regular Students to full-time studies —re-registration of former students not in attendance in the previous session —transfer from part-time to full-time studies —College transfers	
July 1	Last date for new full-time Special Students to apply for admission	
August 15	Last date for students with standing in the Faculty to request registration as Special Students	
September 3	Labour Day (University closed)	
September 4-5	Registration of First-Year students	
September 6-7	Registration of Second-Year students	
September 8-10	Registration of Third-Year students	
September 10	Registration of full-time Special Students	
September 11	Registration of Fourth-Year students	
September 12	Classes begin. The late registration penalty will be enforced	
October 5	No changes in full courses or in first term (F) or in (Y) half-courses may be made after this date	
October 8	Thanksgiving Day (Classes cancelled)	
November 15	Last date to complete the following: —confirmation of programme by each student signing a list of his courses in the office of his College Registrar between October 30 and November 15 —withdrawal from a first term (F) course without academic penalty —Third-Year students to notify their College Registrar if they wish to receive their degree —Fourth-Year students to indicate their choice of degree	
November 30	Fall Convocation	
December 11	First-term classes end. All term work should be completed by this date	
December 12-21	Examination period for F courses and term-test period for multi-section courses	
December 22	Christmas holidays begin	

SCHEDULE OF DATES 1973-1974 (Continued)

Winter Day Session 1973-1974

1974	
January 2	Second-term instalment of fees due
January 7	Second-term classes begin
January 15	Final date for payment of tuition fees without penalty
February 1	No second-term (S) course may be begun after this date
February 15	Last date to withdraw from an extra course or an extra half-course (S) or (Y) or from the University without academic penalty, or for transfer to Extension
February 18-22	Reading week—lectures and laboratory classes will not be held
April 11	Classes end. All term assignments should be completed no later than this date
April 12	Good Friday (University closed)
April 22	Annual examinations begin
May 10	Annual examinations end
June 1	Last date to submit requests to transfer to full-time studies for 1974-75 session
June 5	University Convocation begins
July 10	Last date for students with supplemental privileges to apply to write the August examinations

Summer Session 1974

EVENING		DAY
April 1	Last date for new students, both regular and special, to apply for admission	May 15
April 15	Last date to register without late fee	June 1
May 1	After this date, registration will not be permitted	June 15
May 13	Classes begin	July 2
August 9	Last day of classes	August 9
August 12-16	August examinations for 1974	August 12-16

N.B.

To avoid incurring academic and financial penalties, students must pay their fees on time and complete certain actions in the office of their College Registrar by the following dates:

September 12

October 5

November 15

February 1

February 15

See details listed in this Schedule of Dates and consult relevant sections of the Calendar concerning fees, registration, confirmation of programme, and withdrawal.

How to read the Calendar

The purpose of this Calendar is to serve as a principal counselling guide for students seeking to obtain the degree of Bachelor of Arts, Bachelor of Science or Bachelor of Commerce from the University of Toronto by full-time study.

All students should refer to the Schedule of Dates published on pages 2–3 to avoid incurring academic or financial penalties.

Applicants and newly-admitted students should read the section entitled “The Faculty of Arts and Science and Its Colleges” to familiarize themselves with the College system at this University. Once admitted, a student receives counselling from his College Registrar in matters of a financial, academic, or personal nature, and so this Calendar contains only brief sections on Application and Admission, Fees, Loans and Awards, Registration and Enrolment. Much more complete information is available in other publications sent to students or available through the Colleges.

All students are urged to read the sections entitled Requirements for Standing and Examinations on pages 16–20 as these state concisely what is required in order to obtain a degree. There follows a brief explanation of the Programme in Arts and Science and a wide range of Suggested Programmes of Study for the degree of B.A., B.Sc., or B.Com. An understanding of these programmes is most helpful in selecting five courses each year from the more than 1300 listed alphabetically in the large section of the Calendar entitled Departments of the Faculty and Courses of Instruction. (pp. 49 *et seq.*)

When selecting courses one should read the introductory essays under the departmental titles and seek advice from academic counsellors when necessary. On the inside front cover of this book is a “Key to Course Descriptions” which should be read first in order to understand the arrangement and proper designation of courses and the time-table implications in making up one’s programme of studies. The responsibility for a wise choice rests with the individual student.

An index of the contents is at the end of the Calendar.

Important Notices

- 1 Students who have any problem of an academic or personal nature should consult their College Registrar.
- 2 The courses listed in this Calendar are those offered on the St. George campus.
- 3 Certain specialized courses are available only on the Erindale and Scarborough campuses. Further information about these courses may be obtained by consulting the undergraduate secretary of each department on the St. George campus and the separate calendars published by Erindale College and Scarborough College. Students registered on the St. George campus must petition to take these courses.
- 4 The Council of the Faculty reserves the right to withdraw any course listed in this Calendar or to limit the enrolment.
- 5 In view of increasing costs of supplies and labour, fees and other charges set forth in this Calendar are subject to change by the Governing Council.

THE FACULTY OF ARTS AND SCIENCE AND THE COLLEGES

There are eight colleges which offer programmes in Arts and Science: University College, Victoria College, Trinity College, St. Michael's College, New College, and Innis College located on the St. George campus in downtown Toronto; Erindale College located twenty miles away West of the city and Scarborough College located twenty miles East. Every student must register in one of these colleges if he wishes to proceed towards a degree on a full-time basis. Students proceeding towards a degree on a part-time basis do so either through the Division of University Extension which offers courses on the St. George and Erindale campuses or through Scarborough College.

Classes in Arts were first offered in Toronto in the year 1843 at King's College in the unoccupied legislative buildings on Front Street. During the next decade a residence was built at Queen's Park, King's College was secularized and its name changed to the University of Toronto. In 1853 the University itself became solely an examining and degree-granting body, and "University College" was created to do the entire work of instruction in Arts. In the next half-century Victoria University, the University of Trinity College and the University of St. Michael's College came into federation with the University of Toronto, agreeing to suspend their own degree-granting powers in disciplines other than divinity in favour of the University. The name of the Faculty was changed to "Faculty of Arts and Science" in 1960, and the Faculty Office moved to Sidney Smith Hall, 100 St. George Street. Since that date New College and Innis College were established on the St. George campus, followed by Scarborough College and Erindale College on their own campuses. Arts and Science students registered in any one of these eight colleges may now receive the Bachelor of Arts, or Bachelor of Commerce, or Bachelor of Science degree of the University of Toronto. The annual examinations are conducted by the University, which also grants academic standing upon the results of these examinations and confers the degree.

The colleges on the St. George campus give instruction in "college subjects." These are the subjects taught in each college by the college departments of Classics, English, Ethics, French, German, Near Eastern Studies, Philosophy (St. Michael's College) and Religious Studies. At present English and French are taught in New College by staff members cross-appointed between New College and University College. Students of New College receive instruction in other college subjects through University College, which is also responsible for teaching college subjects to students of Innis College. Most colleges also sponsor courses in special fields. These courses are designated by the prefix "IN" followed by the letter denoting the college.

"University subjects" are those which are normally taught in University buildings to students of all colleges by members of the following departments: Anthropology, Astronomy, Botany, Chemistry, Computer Science, East Asian Studies, Fine Art, Geography, Geology, History, Islamic Studies, Italian, Hispanic Studies, Mathematics, Philosophy, Physics, Political Economy, Psychology, Sanskrit and Indian Studies, Slavic Languages and Literatures, Sociology, Zoology. Certain courses are also offered to Arts and Science students by members of other Faculties, schools and institutes as indicated in this Calendar.

By a system of cross-appointments between the "University Departments" and the colleges more and more students are being taught "University subjects" in their colleges by members of the University staff. All courses offered in Scarborough College and Erindale College are taught on their respective campuses. Members of the teaching staff in these colleges hold dual appointments in their college and in the appropriate university or college department.

ST. GEORGE CAMPUS

UNIVERSITY COLLEGE

<i>Principal</i>	A.C.H. Hallett, B.A., Ph.D.
<i>Registrar</i>	L.W. Ferguson, M.A., Ph.D.
<i>Assistant Registrar (Administrative)</i>	Miss D.C. King
<i>Assistant Registrar (Academic)</i>	Mrs. R.J. Norton, B.A.
<i>Director of Residences and Administrative Assistant to Principal</i>	E.M. Howarth, M.A.
<i>Co-ordinator of College Activities</i>	Miss C.L. Grant, B.A., M.S.W.
<i>Librarian</i>	Mrs. P. Bow, B.A., B.L.S.

University College, established in 1853, was the original Provincial Arts and Science College of the University. Complete information is contained in the *University College Bulletin*, mailed in January to all Ontario secondary schools, and obtainable from the College Registrar. In brief, the College offers the following facilities to its men and women students:

(a) The Laidlaw Library, equipped with a spacious Reading Room and Reference Room, and the Refectory, where cafeteria service is provided.

(b) Residences: accommodation for 413 students is available in two residences operated by the College. The Sir Daniel Wilson Residence and Whitney Hall are both located on St. George Street, adjacent to the main College building. There are single and double rooms, each furnished as a combined bedroom and study. Daily food service is provided from the first day of lectures in September until the end of the examination period in early May. Enquiries should be addressed to the Residence Office, 79 St. George Street, Toronto M5S 1A1.

(c) The Women's Union, 79 St. George Street, provides a centre for the undergraduates of University College, resident and non-resident. It contains a dining hall, common rooms, and also the University College Playhouse, a theatre for student productions.

VICTORIA COLLEGE

<i>President Emeritus</i>	Right Rev. A.B.B. Moore, B.A., B.D., D.D., LL.D.
<i>President and Vice-Chancellor</i>	G.S. French, C.D., M.A., Ph.D.
<i>Principal Emeritus</i>	H. Bennett, B.A., Ph.D., LL.D.
<i>Principal</i>	J.M. Robson, M.A., Ph.D.
<i>Registrar</i>	A.C.M. Ross, M.A., Ph.D.
<i>Director of Development</i>	R.H. Macdonald, A.M., Ph.D.
<i>Bursar</i>	F.C. Stokes, M.A.
<i>Dean of Men</i>	M.S. Cross, M.A., Ph.D.
<i>Dean of Women</i>	Margaret Penman, M.A., Ph.D.
<i>Librarian</i>	Miss L.D. Fraser, M.A., B.L.S.

Victoria College, established in 1836 as a Methodist foundation, entered into federation with the University of Toronto in 1892, and since 1926, has been related to the United Church of Canada. It is open to students of all religious denominations and offers the following residence facilities.

Residences for Men

The Victoria University Men's Residences accommodate 256 students, consisting of students enrolled in Victoria College (Arts and Science) and Emmanuel College (Theology) and students from other colleges and Faculties as space permits. Students who plan to enter Victoria College and who wish to live in residence should apply as early as possible and not wait until they receive their final acceptance into the University of Toronto. If they are not accepted by Victoria College or change their plans, they may cancel their reservation by written notification.

Burwash Hall is the dining hall for all students in residence, and for non-residence students of Victoria and Emmanuel Colleges.

Application forms and further information may be obtained from the Dean of Men, Victoria College, 73 Queen's Park Crescent, Toronto M5S 1K7.

Residences for Women

The Victoria College Women's Residences provide accommodation for 268 women students. When applications exceed available spaces rooms are assigned in order of academic standing. The Dean of Women of Victoria College, the Director of Residence Services and Students' Union, Dietitians, and resident Dons are in charge.

Meals are served in the Annesley Hall dining room and the Wymilwood cafeteria. Each house has a common room, kitchenette, telephone and laundry. There are libraries in Annesley Hall and Margaret Addison Hall.

Application forms and further information may be obtained from the Dean of Women, Victoria College, 73 Queen's Park Crescent, Toronto M5S 1K7.

Victoria College Student Union

Wymilwood is available for the use of all Victoria College students. There are common rooms, a reading room, a record room, and a coffee shop. Rooms are available also for the use of Victoria College and University of Toronto societies upon application made to the Director of Residence Services and Students' Union in Margaret Addison Hall, 140 Charles St. W., Toronto M5S 1K7.

TRINITY COLLEGE

<i>Chancellor</i>	The Most Rev. H.H. Clark, C.C., B.A., D.D., D.C.L., LL.D.
<i>Provost and Vice-Chancellor</i>	G. Ignatieff, M.A., LL.D.
<i>Vice-Provost and Dean of Arts</i>	A. Dalzell, B. Litt., M.A.
<i>Dean of Men</i>	G.A.B. Watson, M.A., S.T.B.
<i>Principal of St. Hilda's College and Dean of Women</i>	Miss M.H. Seaman, M.A.
<i>Registrar</i>	R.L. Cummins, B.A., M.Ed.
<i>Librarian</i>	Miss B. Saunders, B.A., B.L.S.
<i>Bursar</i>	G.O. Shepherd, B.Com.

Trinity College enrolls approximately 800 students in Arts, Science and Commerce. It is the smallest of the Federated Colleges of the University. From its founding as an independent university in 1851 the College has encouraged and maintained a high level of academic achievement. The limited enrolment and small numbers in classes in College subjects foster a unique sense of community among faculty and students. While historically an Anglican foundation, the College is open to students of all denominations.

The College Library, Chapel, coffee shop, dining halls, common rooms and theatrical facilities are provided for the benefit of both the commuting, non-resident and resident students of the College. Nearly forty per cent of the College's students live in residence. The Men of College are accommodated in the Main Quadrangle. St. Hilda's College, a constituent College of the University of Trinity College, provides residence and dining facilities for the Women of College. The Gerald Larkin Academic Building, on Devonshire Place, includes the lecture rooms and offices of most of the teaching staff together with the language laboratory and lockers for commuting students.

For further information about the College and for applications to the residences, please write directly to the Registrar, Trinity College, Toronto M5S 1H8. The Registrar will be glad to see prospective students by appointment.

ST. MICHAEL'S COLLEGE

<i>President</i>	Rev. J.M. Kelly, M.A., Ph.D.
<i>Vice-President</i>	Rev. H.V. Mallon, M.A.
<i>Registrar</i>	Rev. H.B. Gardner, B.A., M.S.L.S.
<i>Assistant Registrar</i>	Rev. S. J. Bianco, M.A., M.Div.
<i>Director of Student Awards</i>	Rev. H.P. Coughlin, M.A., S.T.D.
<i>Bursar</i>	Rev. N. Iversen, M.A.
<i>Dean of Men</i>	R.H. Hayward, B.A.
<i>Dean of Residence (Women) Loretto College</i>	Sister Caroline Dawson, B.A.
<i>St. Joseph's College</i>	Sister Janet Fraser, B.A.
<i>Librarian</i>	Rev. J.B. Black, M.L.S.

St. Michael's College, the Catholic college in the federation, is open to men and women students of all denominations. All prospective students are welcome to see the Registrar. Application for residence, distinct from application to the university, should be made early in the spring.

Residences for Men

For purposes of organization and for academic reasons, St. Michael's makes use of the residential House System. There are eight houses which provide accommodation for 200 students. Each house is under the supervision of a don to whom the students have access at any time. The students' rooms are furnished as combined bedrooms and studies.

St. Michael's College offers accommodation to a limited number of students from other faculties in the University. This is allocated after August 15.

Applications for admission to residence should be made to the Dean of Residence, St. Michael's College, Toronto M5S 1J4.

Residences for Women

Residence is provided for women students at St. Joseph's College, 90 Wellesley Street West, and at Loretto College, 70 St. Mary Street. Application for admission to residence may be obtained by writing to the Dean of either College. Application should be made early.

NEW COLLEGE

<i>Principal</i>	D.G. Ivey, M.A., Ph.D.
<i>Registrar</i>	P.L. Mathews, A.M., Ph.D.
<i>Dean of Men</i>	L.R. Kurtz, M.A.
<i>Dean of Women</i>	Mrs. A. Taylor, B.A.
<i>Librarian</i>	Miss E. Sherritt, B.A., B.L.S.

New College, established in 1962, is open to men and women of all Faculties and Schools of the University. Students in the College whether engaged in the humanities, social sciences, pure sciences or in professional studies, have an opportunity to meet others from quite different fields of study and thus to broaden their views.

Students enrolled in the Faculty of Arts and Science receive instruction in their own college building in some of their "college subjects", while for others the New College classes are merged with those of University College. New College sections are also provided for in some "university" subjects. Students in the professional divisions attend the regular classes of those divisions. Tutorial assistance is provided in various subjects, including Mathematics, Chemistry and Physics. The Writing Facility offers help in written English and French.

Students entering the First Year of any Faculty or School, who wish to become members of New College, apply to the Office of Admissions of the University on the regular application form, indicating New College as the College of their choice.

New buildings, centrally located on the west campus, provide academic, social and dining facilities for all members of the College, and in addition provide accommodation for 291 men and 386 women in residence. Students who wish a place in residence apply directly on a standard form which may be obtained from the Dean of Men or Dean of Women, New College.

INNIS COLLEGE

<i>Principal</i>	P.H. Russell, M.A.
<i>Registrar</i>	D.B. King, M.A.
<i>Co-Registrar</i>	Miss P.C. Cole, B.A.
<i>Assistant to Principal</i>	A.S. Wood, M.A.
<i>Residence Co-Ordinator</i>	Miss L. Bradbury, B.A.
<i>Director of Writing Laboratory</i>	Mrs. E. Cotter, M.A.

Innis College was constituted on July 1, 1964, and admitted its first students in the following September. It is a multi-Faculty college of the University of Toronto, and includes undergraduate students in all Faculties and Schools of the University as well as a limited number of part-time students.

A special feature is the Writing Laboratory. This service offers assistance to Innis College students in the skills and methods of writing essays and other academic reports. A staff of experienced teachers is available to give individual instruction.

Innis College offers a number of innovative and experimental courses which provide students with an opportunity to explore areas not available in the more standard departmental offerings. These courses are listed under "Innis College" in the section of the Calendar entitled Departments of the Faculty and Courses of Instruction.

The College has limited residential space available in houses on campus. Separate application for residence accommodation must be made directly to the Residence Co-ordinator of Innis College.

ERINDALE CAMPUS

ERINDALE COLLEGE

<i>Principal</i>	J.T. Wilson, O.C., O.B.E., Sc.D., Ph.D., LL.D., P.R.S.C., F.R.S.
<i>Dean</i>	E.A. Robinson, Ph.D., D.Sc.
<i>Associate Dean</i>	W.J. Huggett, M.A., Ph.D.
<i>Associate Dean</i>	I.M. Spigel, M.A., Ph.D.
<i>Registrar</i>	J.J. Rae, M.A., Ph.D.
<i>Associate Registrar</i>	L.J. Elmer, B.A., S.T.D.
<i>Librarian</i>	H.L. Smith, B.A., B.L.S.

Erindale College, the newest of the University's colleges, enrolled its first students in 1967. It is located in Mississauga on its own 200 acre campus, on Mississauga Road less than a mile north of Highway #5 and adjacent to the Credit River. The College has been planned primarily with the needs of the undergraduate student in mind and its rural campus provides a good recreational and learning environment in a relaxed atmosphere. Students and faculty may also make use of the facilities on the central St. George campus, including the Library and Hart House.

In 1973 extensive additional facilities will be opened, including a gymnasium, squash courts, main lecture theatres, the permanent library, a large dining room, common rooms and study areas. New student housing should also be available.

Students at Erindale can qualify for the three and four year B.A. or B.Sc. degrees and for the B.Com. degree. Specialization is available in most of the subjects offered in the Faculty of Arts and Science. While the degrees offered and the standards are common with those of the rest of the University, the new campus provides unique opportunities for innovation and experimentation in curricular and teaching methods and learning developments such as computer-assisted learning and film-making.

A unique programme in Art Education is offered in which students may take courses in art history at Erindale and practical studio work at Sheridan College while working towards a University of Toronto degree.

Students intending to become professional surveyors can enrol in the Survey Science Programme, a feature of Erindale. Graduates in the four-year course will receive a B.Sc. degree and also satisfy the requirements of the Association of Land Surveyors.

Students participate fully in College government, publish a College paper, operate a radio station and benefit from membership in a liberal arts and science College of moderate size within a large university of international reputation.

Application to Erindale College is made through the Office of Admissions of the University and prospective students should indicate Erindale College as their College of first choice on the application form.

The College has residential space available in houses on campus and accommodation for an additional 250 students in "town-houses" should be available by September, 1973. Enquiries about housing should be addressed to Mr. M. J. Lavelle, Director of Student Affairs (828-5286).

Regular bus services run by the College connect the campus to the St. George Campus, the Islington Avenue terminal of the Toronto Transit Commission Subway and the Clarkson GO Station.

An extensive programme of courses in the Division of Extension is offered on the campus during the Winter Session and Summer Session (Day and Evening). Information may be obtained from the College (828-5244), or from the Division of University Extension.

General information about the College and copies of the Calendar may be obtained by writing to the Registrar, Erindale College, University of Toronto, Mississauga, Ontario (828-5305).

SCARBOROUGH CAMPUS

SCARBOROUGH COLLEGE

<i>Principal</i>	D.R. Campbell, D.F.C., M.A.
<i>Associate Dean and Registrar</i>	J.D. King, B.A., Ph.D.

Scarborough College, which enrolled its first students in 1965, offers courses in all years of the New Programme in Arts and Science.

The College is located in West Hill, at the eastern end of Metropolitan Toronto, and is easily accessible from central Toronto by the Don Valley Parkway and the Macdonald-Cartier Freeway, or by the College bus service to and from the St. George campus and the eastern end of the T.T.C. subway.

Scarborough College students have available at their campus first-rate library and recreational resources, and may also draw on those of the St. George Campus.

The College is distinctive in several ways. First, it makes available to its students and faculty the advantages of membership in a large institution of international renown, but in the more personal environment of a liberal arts and science college of moderate size. Secondly, the College is a centre for innovation in curriculum and teaching methods. Thirdly, it is itself architecturally spectacular.

Students who wish to study full- or part-time at Scarborough College should apply in the usual manner through the Office of Admissions of the University of Toronto and should indicate Scarborough College as the College of their choice. The College timetable runs from 9 a.m. to 10 p.m. and all students are permitted to enrol in any course at any time subject to the normal conditions. The College Calendar and any further information may be obtained by writing to The Office of the Associate Dean and Registrar, Scarborough College, 1265 Military Trail, West Hill, Ontario, M1C 1A4 (Telephone 284-3300).

ALL CAMPUSES

DIVISION OF UNIVERSITY EXTENSION

<i>Acting Director</i>	E.M. Gruetzner, B.A.
<i>Assistant Director</i>	A.R. Waugh, B.A.

The Faculty of Arts and Science through the Division of University Extension serves an increasing number of adults who, while employed during the daytime, wish to improve their academic qualifications for personal or professional reasons. Qualified applicants may proceed as part-time students to a bachelor's degree.

The summer day session provides six weeks of concentrated daytime study for students who are free to attend lectures in July and August. In the summer evening sessions, which commences in May and ends in August, classes are conducted twice weekly. In the winter session classes are held from September to April.

In addition to the courses offered on the St. George campus, and as an integral part of that programme, courses are offered on the Scarborough College campus and Erindale College campus.

The calendar entitled "Degree Programmes in Extension" describes in detail the procedure for obtaining a degree through part-time studies in both winter and summer sessions, and other regulations pertaining to the programme of studies. Further information is available on request from the Director, Division of University Extension, 119 St. George Street, Toronto M5S 1A1 (Telephone 928-2400).

APPLICATION AND ADMISSION

Complete details of the requirements and of the application procedure for admission to the Faculty as a full-time student are contained in the Undergraduate Admission Handbook, which is revised each year and published by the Office of Admissions, University of Toronto, Toronto M5S 1A3, Ontario, Canada. Application forms and copies of the Undergraduate Admission Handbook may be obtained from any secondary school in Ontario, or from the Office of Admissions.

Early application is desirable and forms must be received by June 1st for admission to the session as a full-time student.

The calendar entitled *Degree Programmes in Extension* describes in detail the procedure for admission to, and registration for, part-time classes in both winter and summer sessions, and other regulations pertaining to the programme of studies. Further information is available on request from the Director, Division of University Extension, 119 St. George St., Toronto M5S 1A1 (Telephone 928-2400).

ONTARIO GRADE 13 APPLICANTS

An applicant who applies for admission while in Grade 13 should do so on a General Application Form obtainable from his secondary school.

An applicant who has completed Grade 13 before he applies should write to the Office of Admissions for a Preliminary Application Form.

APPLICANTS FROM OTHER PROVINCES OR COUNTRIES

An applicant who is completing, or has completed a "senior matriculation" programme in another province or country should write to the Office of Admissions for a Preliminary Application Form and an Undergraduate Admissions Handbook.

ADMISSION AS A NON-MATRICULANT

An applicant who will have been a resident of Ontario for at least one year by October 1st, who will be at least twenty-three years of age by that date and who did not complete an Ontario Grade 13 programme or its equivalent may request admission as a "non-matriculant" on the basis of demonstrated ability and experience and completion with high standing of at least one of the Pre-University Courses offered by the Division of University Extension.

ADMISSION WITH ADVANCED STANDING

An undergraduate of another university, or of another faculty or school of this university, may be admitted to advanced standing if he has obtained high standing in his previous studies, and if he has completed one or more courses the content of which is considered to be equivalent to that of courses offered by this Faculty.

An applicant for admission with advanced standing should write to the Office of Admissions for a Preliminary Application Form, enclosing a copy of his secondary school transcript (unless he is enrolled in another faculty or school in this University) and of his transcripts for all post-secondary studies. All such transcripts should show the specific courses which he has completed, and the grade or mark obtained in each course.

FEES

Prior to registration each student newly admitted to the Faculty and each returning student will be sent a fees form and a schedule of fees stating the academic and incidental fees required, the date due, and the method of payment. Fees vary slightly by college and from year to year, and are subject to change by the Governing Council. The approximate cost for a student in Arts and Science is \$630 annually for tuition and incidental fees such as student organizations, athletics and health services. Residence fees are separate and generally approximate \$1100 per year for room and board.

For further information concerning fees, students should contact the Fees Department, Office of the Comptroller, 215 Huron Street, Second Floor, University of Toronto, Toronto M5S 1A2 (Telephone 928-2142). Students of the federated colleges (Victoria, Trinity, St. Michael's) should contact their college bursar. Information regarding residences will be sent on request to the residence concerned or to the Office of the Director of Administrative Services, Simcoe Hall, University of Toronto.

Each Special Student enrolled in the Faculty of Arts and Science is required to pay fees at the office of the Comptroller, St. George campus, according to a schedule to be set.

Application Fee

Each applicant who is not in full-time attendance at a Canadian secondary school or who has not previously registered at this University is required to pay an application fee of ten dollars (\$10) when submitting his application form to the Office of Admissions, University of Toronto.

Paying by Instalments

Each student who pays his fees in two instalments (September and January) must pay an instalment charge of twelve dollars (\$12).

Transcripts

Transcripts of academic record are furnished by the Faculty Office on payment of a fee of one dollar (\$1) each. For each additional copy ordered at the same time, the fee is fifty cents (.50c).

Other Fees

Study Elsewhere

Each student authorized to participate in the Study Elsewhere programme must pay a fee of one hundred dollars (\$100) to the Comptroller and present his receipt to his College Registrar prior to departure.

Outside Centre Fee

Each student who applies to write an examination outside Toronto must submit with his application a fee of ten dollars (\$10) plus five dollars (\$5) for each additional paper to be written at the same outside centre.

Special Examination Fee

Each student who is granted permission to write a special examination must pay to the Comptroller a fee of ten dollars (\$10).

Supplemental Examination Fee

Each student who is permitted to write a supplemental examination must pay at the time of his application a fee of ten dollars (\$10) for one paper plus five dollars (\$5) for each additional paper.

Fee for Re-checking Marks

A student who requests that his marks be re-checked must submit with his petition a fee of five dollars (\$5), which will be refunded if an error is found.

Penalties

Students are urged to consult frequently the Schedule of Dates printed at the beginning of this Calendar as this sets forth the dates by which certain administrative action is required or penalties may be incurred. These charges are as follows:

Late Registration Fee

Each student who registers after the last date for normal registration must pay a late registration fee of ten dollars (\$10); for each day thereafter the fee is an additional one dollar (\$1).

Late Confirmation of Programme

Each student is required to confirm his choice of courses between October 30 and November 15 by signing his programme in the office of his College Registrar. Failure to do so will result in a penalty of one dollar (\$1) per day beyond the deadline to a maximum of twenty dollars (\$20).

Late Payment of Second Instalment

A student who pays the balance of his fees after the Second Instalment is due incurs a penalty of fifteen dollars (\$15).

Outstanding Fees and Charges

Students who have not paid their fees or residence dues in full or who have outstanding library dues or bookstore accounts by the end of the session will not be permitted further registration in the University, will not have transcripts issued on their behalf, and will not receive their diploma (if in their graduating year) until payment is made.

Canada Student Loans Plan

Full details of this Plan are available in a brochure issued each spring by the Government of Canada. Basically the Plan is designed for those students who have resided in Canada for twelve months and demonstrate financial need, but who do not qualify for assistance under the Ontario Student Awards Programme. The application form for the Ontario Student Awards Programme is also used for the Canada Student Loans Plan.

Application forms and brochures are available from the University of Toronto, Office of Student Awards, and all other post-secondary institutions, and should be submitted to the institution which the student plans to attend.

Students who intend to study outside Ontario or abroad should apply through the Department of Colleges and Universities, Mowat Block, Queen's Park, Toronto, Ontario.

Ontario Student Awards Programme

All students who are attending eligible post-secondary institutions in Ontario may qualify for assistance under this Programme provided that they satisfy the residence requirements as outlined in the Ontario Student Awards brochure and demonstrate financial need. An Award under this Programme will be made to the extent of established need in a combination of a non-repayable grant and a Canada Student Loan.

Application forms and brochures for the 1973-74 Programme will be available early in May, 1973. They may be obtained from the University of Toronto, Office of Student Awards, and all other post-secondary institutions. Applications should be submitted *in person* at the institution which the student plans to attend.

REGISTRATION AND ENROLMENT

Every student in full-time attendance proceeding to a degree in the Faculty of Arts and Science is required to register in one of University College, Victoria College, Trinity College, St. Michael's College, New College, Innis College, Scarborough College, Erindale College, unless proceeding towards a degree in the Division of University Extension. Information regarding the relation of the Colleges to the University will be found under the heading "The Faculty of Arts and Science and the Colleges." Students registered for part-time studies are registered in the Division of University Extension, or at Scarborough College.

Registration information will be mailed to each student in the summer. A student registers for his programme of studies in the Faculty of Arts and Science through the Registrar of his College. A full-time Special Student registers through the Associate Secretary of the Faculty.

A student seeking detailed information about a specific course, or programme of studies, should consult the Adviser or Undergraduate Secretary of the Department in which the course or programme is offered.

Students who are registering in the Faculty for the first time or registering again in First Year must bring their letter of admission at the time of registration.

When registering, all students are asked to give their Social Insurance Number.

At registration, each student will complete a year card and will receive:

- (1) a University of Toronto registration card,
- (2) an individual timetable for the programme of courses requested on his pre-registration form.

The registration copy of all fees forms received at the Office of the Comptroller by mail will be sent to the College Registrar concerned prior to the day of registration. If necessary, a student may bring his fees and fees form, together with his cheque for fees and/or his Ontario Student Award Programme statement of award, in person to the Office of the Comptroller or to the Bursar of his College in the case of Victoria, Trinity and St. Michael's Colleges. If this is done during or just before the Registration period, then the student will have to bring the receipted registration copy to the College Registrar's Office in order to register.

LATE REGISTRATION

No student may register and enrol late except by petition. The Council may refuse permission to register late. The late penalty will be enforced, and every petition for late registration and enrolment must be accompanied by the late registration fee. Petitions for the refund of this fee must be submitted by October 6, with a receipt indicating the amount paid.

CHANGE OF COURSE

Students who wish to make a change in their programme after registration must do so through the office of their College Registrar. All requests to change courses other than second-term (S) courses should be made as early in the session as possible, preferably before October 5th. Those submitted after that date will be granted only in the most exceptional circumstances. No second-term course may be begun after February 1st.

CONFIRMATION OF PROGRAMME

All full-time students must confirm their choice of courses between October 30th and November 15th by signing their programme in the office of their College Registrar. This procedure is essential in order to ensure accurate records and so that examination arrangements may be made. Third- and Fourth-year students must indicate their choice of degree. Regular students confirm their programmes at the office of their College Registrar; full-time Special Students only at the office of the Secretary of the Faculty.

WITHDRAWAL

A student who wishes to withdraw from a course or from his entire programme of studies during the session must do so through his College Registrar. This must be done prior to November 15, if the course is offered only in the First Term, or prior to February 15 in all other cases, or he will be considered to have failed. An extra course or half-course carried beyond these dates will be recorded as a credit or discredit on the transcript.

The College Registrar is unable to authorize any refund of fees until he receives from the student written confirmation of his intention to withdraw and the registration card.

SPECIAL STUDENTS

A candidate for admission as a Special Student (one not proceeding to a degree in this Faculty) must apply to the Office of Admissions, University of Toronto for forms of application for admission and return them before August 1st for the Winter Session commencing in September. He should apply for day classes only if intending to register in a full-time programme of five courses. Part-time Special Students (i.e., those taking three or fewer courses in a session) will register in the Division of University Extension but may be given permission to take one or more courses in day classes.

Each application for admission is considered individually in terms of the student's previous academic record. Transcripts of record from other universities or faculties will therefore be required.

Regular and Special Students who have previously registered and obtained standing in the Faculty of Arts and Science must submit a request for registration as a Special Student each session to the Secretary of the Faculty, Sidney Smith Hall, 100 St. George Street, Toronto M5S 1A1.

Unless clearing a condition, courses taken as a Special Student may not be credited towards a degree offered by this Faculty. Students taking courses for credit or admission elsewhere are advised to consult the institution concerned before registering. Registration instructions will be sent to applicants on admission.

Special Students must obtain standing in any course in which they are enrolled, before they may enrol in an advanced course in the same subject.

Special Students who do not write the annual examinations, or who withdraw from a First-term course after November 15 or from any other course after February 15, except for medical or similar reasons (for which proof must be submitted), will be considered to have failed to obtain standing in the course. Special Students will not be permitted to write supplemental examinations.

PART-TIME STUDENTS

Applicants for part-time studies in the Winter Session or a Summer Session (day or evening) as Regular or Special Students should consult the calendar entitled "Degree Programmes in Extension" available from the Office of the Director of University Extension, 119 St. George Street, Toronto M5S 1A1, Ontario. Registration instructions will be sent to those admitted to each session.

REQUIREMENTS FOR STANDING

Each student in full-time attendance in the Faculty of Arts and Science devises his own programme by combining together each year five full courses chosen to fit his interests, subject only to the following:

- (a) All stated prerequisite and co-requisite requirements shall be satisfied.
- (b) Any two half courses are equivalent to one full course; they may be from different subjects.
- (c) An extra full or half-course (not for credit towards a degree) may also be taken in each year, and standing obtained will be recorded.

FIRST YEAR PROGRAMME

A student shall be said to have completed a First Year programme when he has obtained standing in five courses. The courses taken will normally be those designated as being available to First Year students but other courses may be taken with the permission of the department concerned.

A student may not continue in full-time attendance unless he has standing in at least four courses.

SECOND YEAR PROGRAMME

A student shall be said to have completed a Second Year programme when he has obtained standing in ten courses, at least three of which must be 200- or higher-series courses.

A student in Second Year may not continue in full-time attendance unless he has standing in at least nine courses.

THIRD YEAR PROGRAMME AND REQUIREMENTS FOR THREE-YEAR DEGREE

A student shall be said to have completed a Third Year programme and shall be entitled to receive a Bachelor of Arts or Bachelor of Science degree when he has:

(a) obtained standing in fifteen courses, at least eight of which must be 200- or higher-series courses;

(b) a final mark of 60% or better in each of at least eight of the fifteen courses. Of these eight at least four must be 200- or higher-series courses;

(c) for a Bachelor of Science degree, included in the eight or more required 200- or higher-series courses at least six courses offered by one or more of the following departments: Astronomy, Botany, Chemistry, Computer Science, Geography,* Geology, Mathematics, Physics, Psychology, Zoology or certain courses offered by other departments (ANT 203, 336F, 338S, 431, JAZ 421F, ECO 220) and faculties.

NOTE: A Third Year student may not continue in full-time attendance until he has completed the requirements for a three-year degree. A student should notify his College Registrar no later than November 15th if he wishes to receive his degree. When it is conferred, the designation "Bachelor of Arts (Three-Year)" or "Bachelor of Science (Three-Year)" will appear on his academic record.

ENTRY INTO A FOURTH YEAR PROGRAMME

A student shall be permitted to enter a Fourth Year programme only if he has completed the requirements for a bachelor's degree as described above.

*Courses in Physical Geography and Analytical Methods in the 200- or higher-series may be included in the science component of a B.Sc. programme. The following courses listed in the 1973-74 Calendar fall into this category: GGR 200, 201, 202, 205F, 207S, 270, 301, 306F, 307S, 370F, 371S, 372F, 373S, 375S, 390F and 491 (Research paper in Physical Geography).

FOURTH YEAR PROGRAMME AND REQUIREMENTS FOR A FOUR-YEAR DEGREE

(a) A student shall be said to have completed a Fourth Year programme and shall be entitled to have the designation “Bachelor of Arts (Four-Year)” or “Bachelor of Science (Four-Year)” entered on his record when he has:

- (i) qualified for a 15-course degree;
- (ii) at the first six attempts completed an additional five courses, no more than one of which may be a 100-series course;
- (iii) obtained a final mark of 60% or better in each of at least four of the five courses;
- (iv) for a Bachelor of Science degree, included in the twelve or more required 200- or higher-series courses at least nine courses offered by one or more of the following departments: Astronomy, Botany, Chemistry, Computer Science, Geography*, Geology, Mathematics, Physics, Psychology, Zoology or certain courses offered by other departments (ANT 203, 336F, 338S, 431, JAZ 421F, ECO 220) and faculties.

(b) For the degree of Bachelor of Commerce a student must have:

- (i) qualified for a 15-course degree;
- (ii) obtained standing in twenty-three courses as prescribed in the notes below and as outlined for the Programme in Commerce and Finance;
- (iii) obtained a final mark of 60% or better in each of at least four of the six courses in his fourth year and in at least seventeen of the twenty-three courses in his four-year programme.

NOTES: The twenty-three courses must include at least seven courses in Commerce, at least seven courses in Economics, and at least four courses in other than Commerce or Economics two or more of which must be taken in second or later years.

The required Commerce courses include Financial Accounting, Managerial Accounting, Information Systems & Control, and Corporation Finance.

The required Economics courses include Introductory Economics, Microeconomic Theory, Macroeconomic Theory, Statistics, Economic History (or History of Economic Thought) and one advanced course with an analytical emphasis.

The required courses in other than Commerce or Economics must include a course in Mathematics (calculus).

A sixth course taken in first year will not count as one of the twenty-three courses required in the Programme.

In each of the second, third and fourth years six courses must be taken through the first and second terms.

No more than eight 100-series courses can be taken in the four-year programme.

*Courses in Physical Geography and Analytical Methods in the 200- or higher-series may be included in the science component of a B.Sc. programme. The following courses listed in the 1973–74 Calendar fall into this category: GGR 200, 201, 202, 205F, 207S, 270, 301, 306F, 307S, 370F, 371S, 372F, 373S, 375S, 390F and 491 (Research paper in Physical Geography).

PROBATION, SUSPENSION AND REFUSAL OF FURTHER
REGISTRATION IN THE FACULTY

1. A student will be placed *on probation* if:
 - (a) he fails two or more courses in any session, or
 - (b) at the end of any session (Winter or Summer) including or subsequent to that in which the fourth course is attempted, he has obtained a grade of C (or higher) in fewer than 50% of his course attempts since beginning studies leading to the degree. Under these circumstances he will be warned that he must (re-)gain the required 50% of C's by the end of the next comparable academic session.
2. A student will be *suspended* from the Faculty for *one* calendar year if:
 - (a) while on probation he fails two or more courses, or
 - (b) he does not (re-)gain the required 50% of C's within the specified period on probation.
3. A student will be *suspended* from the Faculty for *three* calendar years if:
 - (a) he fails six courses
 - (b) he fails to satisfy the requirements for a three-year degree in his first twenty attempts
 - (c) while on probation a second time he
 - (i) fails two or more courses, or
 - (ii) does not regain the required 50% of C's
 - (d) after return from a one-year suspension he
 - (i) fails two or more courses in any session, or
 - (ii) fails to recover the required 50% of C's by the end of the session, or, in the case where that is impossible, fails to obtain a C (or higher) in any course attempted until such time as the 50% requirement has been satisfied.
4. A student who wishes to return to studies in the Faculty after having incurred a three-year suspension may, after the period of suspension has expired, enrol in any one session in two courses which he has not previously attempted. If he obtains an average grade of B in the two courses, and not less than C in either, he will retain credit for these and for all courses in which he was previously successful, and he may re-enrol to complete the remaining courses required for the degree on the condition that he records no failures. A failure in a course after return from a three-year suspension, or failure to obtain the specified level of performance in the first two courses attempted after such a suspension, will result in refusal of further registration in the Faculty.
5. A Special Student whose record is unsatisfactory may be refused further registration in the Faculty.

GENERAL REGULATIONS FOR STANDING

- (a) All full-time students proceeding towards a degree in the Faculty will normally be expected to take five courses in the winter session of each year. With the approval of the College concerned and the Faculty, exceptions may be made.
- (b) (i) A student may withdraw from the Faculty without academic penalty up to February 15th. However, if he withdraws in the Second Term, credit will be retained for any First Term half-courses completed and failure noted for any First-Term half-course failed.
- (ii) If exceptional circumstances warrant it a student may be permitted, on petition, to withdraw from not more than one course (or two-half-courses) of his programme without academic penalty.
- (iii) A student may withdraw without academic penalty and without petition from an extra first term half-course before November 15th and from an extra full course or an extra half (S or Y) course before February 15th.
- (c) A student who wishes to enrol in three or fewer courses in any session may be admitted to the Division of University Extension. Such a student will normally enrol in winter evening courses or summer day or evening courses, but may, with the permission of the Department concerned and of the Division of University Extension, also enrol in winter day courses. He may take a maximum of three courses in a winter session and two in summer session. Students may transfer from full-time attendance to the Division of University Extension before February 15th.
- (d) Normally, credit towards a degree will not be given for an extra (sixth) course.

STANDING IN A COURSE

The following scale of marks and grades will be used for all courses and half-courses in all years:

Marks	Grade
80% — 100%	A
70% — 79%	B
60% — 69%	C
50% — 59%	D
below 50%	Fail

(The above grades are also used to designate the overall average attained in each year. A final average of B + (77%–79%) may also be awarded.)

No grade will be awarded in a 100-series course in which standing is obtained by successfully writing a supplemental examination after failure at the first examination. In such cases “Credit” will be recorded on the transcript as well as the final mark.

In the case of half-courses, standing must normally be obtained in each half-course attempted. Marks in two half-courses may not be averaged to produce standing in an equivalent whole course, except where the department(s) concerned specify beforehand that this will be permitted for particular and stated combinations of two half-courses.

The method of arriving at a final mark for each 200- or higher-series course (or half-course) will be decided by the Department offering the course. The final mark in the 100-series courses will normally be made up of a term mark and an examination mark, with the restriction that not less than one-third nor more than two-thirds of the final mark will be based on term work. Final examinations will normally be held in 100-series courses, and requests for exemption of courses from this regulation shall be brought before the Council.

AEGROTAT CONSIDERATION

If the ability of a student to complete a course is affected by illness or domestic problems occurring after November 15 (First-term courses) or February 15 (Second-term and full courses), a petition may be made through his College Registrar for consideration by the Faculty. If there are adequate grounds for the petition, the Department concerned will determine the status of the work done by the student and the steps, if any, that he must take in order to complete the course.

Such petitions must be filed on or before the last day of the relevant final examination period, together with a medical certificate which includes a statement that the candidate was examined at the time of the illness, or other evidence to support the petition.

EXAMINATIONS

ATTENDANCE AND EXAMINATIONS

Students proceeding to the degree are required to attend the courses of instruction and the examinations in all subjects prescribed. A student whose attendance at lectures or laboratories or whose work is deemed by the Council of the Faculty to be unsatisfactory, may have his registration cancelled at any time by the Council.

No candidate will be admitted to examinations unless the Head of his College certifies that he has complied with all the requirements of the College.

Students may not rewrite an examination in a course in which they have standing.

THE ANNUAL EXAMINATIONS

The annual examinations are held in late April and early May; final examinations in first-term courses are held in December.

Arrangements may be made to enable eligible candidates to write supplemental examinations in one of the following places: Banff, Calgary, Charlottetown, Edmonton, Fredericton, Halifax, Kapuskasing, Kenora, Kingston, Kirkland Lake, London, Montreal, North Bay, Ottawa, Quebec, Regina, Saskatoon, Sault Ste. Marie, St. John's (Nfld.), Sudbury, Thunder Bay, Vancouver, Whitehorse, Windsor, Winnipeg, and London, England. Applications for such arrangements must be made not later than November 15, accompanied by the required supplemental examination fee and the special fee.

Candidates for the annual examinations at outside centres must notify the Secretary of the Faculty before April 1st if they do *not* wish to write one or more of the examinations for which they applied; otherwise the fee will be forfeited.

THE AUGUST EXAMINATIONS

The August examinations are held in the week following the conclusion of summer session classes. They are open to students enrolled in the Summer Session (evening and day) and to students eligible to write supplemental or deferred examinations.

Candidates who are permitted to write supplemental or deferred examinations must submit a completed printed form of application to the Secretary of the Faculty by July 10. After this date an additional fee of one dollar per day to a maximum penalty of \$20 must be paid. No application will be accepted after July 31. They may write these examinations at the places listed above as outside centres. Such candidates must make application for this privilege before July 10 and must pay the special fee.

Candidates for the August examinations at outside centres must notify the Secretary of the Faculty before August 1 if they do *not* wish to write one or more of the subjects for which they applied; otherwise the fee will be forfeited.

SUPPLEMENTAL EXAMINATIONS

Students in a First Year programme may write a supplemental examination in August in one failed 100-series course if they have a term mark in that course of at least 60%. Failure in a supplemental examination will not count as a second failure, but will necessitate re-enrolment in the failed course or a substitute.

Students in Second, Third and Fourth Years and Special Students will not be permitted to write supplemental examinations in 100-series courses and none will be offered in 200-, 300- and 400-series courses.

ACADEMIC RECORDS

DEGREES

Students are permitted to qualify for only one degree (Bachelor of Arts, Bachelor of Science, or Bachelor of Commerce) by completing a four-year programme of studies.

A student who qualifies for a Bachelor of Arts or Bachelor of Science degree at the end of his Fourth Year will graduate and receive his diploma at that time unless he has already done so at the end of his Third Year. A student who wishes to receive his degree at the end of his Third Year must notify his College Registrar at the time of confirmation of programme early in November.

TRANSCRIPTS

Copies of a student's transcript of academic record will be issued at his request, subject to reasonable notice and a nominal copying fee. Requests should be submitted in person or by writing to the Secretary, Faculty of Arts and Science, Sidney Smith Hall, 100 St. George Street, Toronto M5S 1A1. (Telephone 928-3388)

CHECKING OF MARKS

It is a policy of the Faculty that no examination papers or essays will be re-read or re-evaluated after results have been issued. Examination papers are re-read in each examination in which a mark of less than 50 percent has been assigned, and no appeal will be considered for further re-reading of such papers. Papers in which at least 50 percent has been obtained will not be re-read.

All results are carefully reviewed before being released. However, the clerical work involved in the department and in the Faculty Office will be checked if a petition is submitted through the College or the Division of University Extension with a fee of five dollars per course. This fee will be refunded if an error is found.

PLAGIARISM

Plagiarism is the act of presenting the ideas or words of another as your own. While it may be argued that few ideas are original, instructors expect students to acknowledge the sources of ideas and expressions that they use in essays. To represent them as self-created is dishonest and academically worthless.

You may quote or paraphrase another writer if he has stated an idea strikingly, as evidence to support your arguments or conclusions, or as a point against which to argue, but such borrowing should be used sparingly and always indicated in a footnote. The aim of scholarship is to develop your own ideas and research and only by trying to develop your own thoughts and arguments will you mature academically.

To provide adequate documentation is not only an indication of academic honesty but also a courtesy enabling the teacher to consult your sources with ease. Failure to do so constitutes plagiarism which is subject to serious academic penalty.

THE PROGRAMME IN ARTS AND SCIENCE

The curriculum in Arts and Science is based on the principle that all students should be allowed access equally to academic resources of the highest quality and the greatest range, so that they can investigate many fields of learning and develop their own particular intellectual interests and abilities. In the First Year, the curriculum encourages a broad investigation of subjects by offering almost unrestricted choice of five (or, if desired, six) of the courses available to first-year students. This freedom allows the student to pursue his own inclinations without necessarily committing himself to any specified long-term programme, while at the same time leaving open many possibilities for specialized study in higher years. Since the choice of courses and combinations of courses is largely left to the student, each in effect may follow an individual academic programme from year to year.

The building of such programmes in each year and over the three or four years of study will involve, on the part of a student, not only a prior questioning of personal ambition, values and capabilities but also a considerable investigation of the details in the curriculum of courses offered in the Faculty of Arts and Science.

There is a great variety of subjects from which to choose and of courses within subjects. When a student settles upon an area of interest, his next decision will have to do with the degree of specialization with which he will study his chosen subject. Then comes the process of selecting courses. At each stage in this process, consideration should be given to the range of his interests and, through that, to the relationships between subjects and thus the interconnections between courses.

Ideally, a programme of study should not be just a collection of courses, but, at least potentially, an organic unity. One programme might be completely diversified over five or six subjects in each year and a much larger number in three or four years. Another might be concentrated in one subject to the exclusion of all but a few courses in closely related fields. The majority will range between these extremes.

Some individual courses are themselves combinations of subjects, and a new series of these is being developed by the Faculty under the heading "Interdisciplinary Studies". In these courses the instructors come from two or more of the traditional academic disciplines and are joined with their students in the exploration of relatively new areas of study. Courses offered under Interdisciplinary Studies have code designations beginning with the letters "INX" in the listings contained in this Calendar. Interdisciplinary courses sponsored by Colleges are designated INI, INM, INT, INU, INV.

COUNSELLING

To make full use of the academic resources of the Faculty of Arts and Science, students must seek appropriate advice and counselling. This is provided by the Departments and Colleges through members of the teaching staff and Registrars who are available to discuss academic and other matters with incoming students and those already in attendance. Because the University of Toronto offers a great number and variety of courses, those who want advice of this kind should begin to obtain it as early as possible, preferably during the winter and spring. It is important that they make appointments with the persons whom they wish to see. The appropriate names and telephone numbers are included in this Calendar under the various departmental headings. The names of the College Registrars are as follows:

University College	Prof. L.W. Ferguson	928-3171
Victoria College	Prof. A.C.M. Ross	928-3800
Trinity College	Mr. R.L. Cummins	928-2687
St. Michael's College	Rev. H.B. Gardner	921-3151
New College	Prof. P.L. Mathews	928-2463
Innis College	Mr. D.B. King and Miss P.C. Cole	928-2511
Erindale College	Prof. J.J. Rae and Prof. L.J. Elmer	828-5231
Scarborough College	Prof. J.D. King	284-3139

It should be noted that some courses in the more popular subjects are likely to attract more students than can be accommodated if a proper standard of instruction and learning is to be maintained. Restrictions on enrolment in such courses may be unavoidable; therefore students should seek advice and make their selection of courses as early as possible.

Students should attempt to relate their academic programmes to their longer-range plans, and to this end should make themselves familiar with the requirements of such places as graduate schools, professional faculties, and Colleges of Education.

THE HUMANITIES

In general, the Humanities are concerned with the historical development and contemporary aspects of human experience. They examine and evaluate the ever-present relations of man to man, man to society, man to God, and man to himself. Specifically, different disciplines within the Humanities deal with language and culture, with intellectual, political, social, economic, religious and cultural history, and with the arts; in each of these areas there is a concern with man's powers of making and using concepts, and of reflecting on his own nature and condition.

In many cases, humanistic interests overlap the interests of the social scientist, who deals with the same phenomena from a different point of view and by different methods. The natural sciences, while their materials and methods are clearly distinguishable from those of the Humanities, also have an intimate bearing on humanistic problems. To attain a broad awareness of the human condition, including such vital matters as the determination of solutions and the formation of policies, the student who wishes to choose a majority of courses in the Humanities would be wise to select some courses in the Social and Natural Sciences.

The disciplines generally considered, at the University of Toronto, to fall within the Humanities include Classics, East Asian Studies, English, Fine Art, French, German, History, Islamic Studies, Italian, Hispanic Studies, Music, Philosophy, Religious Studies, Sanskrit and Indian Studies, and Slavic Languages and Literatures. (Students should realize, however, that some disciplines, such as History, Linguistics, Political and Moral Philosophy, and studies of particular areas and cultures, can also be considered as Social Sciences, and that Mathematics has traditionally been regarded as an integral part of humanistic education.) Interdisciplinary courses in Literature are designated INL.

As indicated above, each of the disciplines mentioned offers a programme for students desiring to specialize. The curriculum offers wide opportunities, also, to those who wish to concentrate their studies, but who either have not yet decided to specialize, or do not wish to specialize.

THE SOCIAL SCIENCES

The Social Sciences are defined by their subject matter and by their methods. Their basic subject is the interaction of human beings in association with one another; their basic methods are analytic and descriptive; their aim is to understand human behaviour and, so far as is scientifically feasible, to predict it. Individual disciplines range widely from historical studies of civilizations, through comparative analyses of societies, to specific examinations of small groups in particular situations. The relation of man to his environment is integral to many subjects; consequently social scientists are concerned with such matters as urban life, communications, ecology, and national resources, to name but a few. In these cases and many others, there are close connections among the Social Sciences, the Natural Sciences and Mathematics, and the Humanities: for instance, a student interested in the economic aspects of ecology will find biological studies essential to full understanding of the problems; a student of communications from a sociological viewpoint will benefit from a study of language and linguistics; a student working towards a complete picture of national resources policy will need to be aware of scientific disciplines. In defining his special interest, then, each student should examine the related areas, both within and without the Social Sciences, and seek counselling in choosing his programme.

The disciplines generally considered at the University of Toronto to fall within the Social Sciences include Anthropology, Geography, Political Economy (comprising Commerce, Economics, and Political Science), and Sociology. Psychology is also often considered a Social Science. As indicated above, however, many other disciplines are closely related. There are obvious links in content and approach with such subjects in the Humanities as History, Linguistics, Philosophy, Religious Studies; with those disciplines dealing with the culture of civilizations, such as East Asian Studies, and Islamic Studies; and

with the language departments. On the other hand, there are equally obvious links with Mathematics and Computer Science, which supply essential methodological tools and with the Natural Sciences (certain investigations in Psychology, for example, overlap similar ones in Biology). It should be noted that programmes in Psychology and in Physical Geography can qualify for the B.Sc. degree.

THE NATURAL SCIENCES AND MATHEMATICS

Science, the study of natural phenomena, embraces a broad spectrum of subjects ranging from Mathematics, Physics, and Astronomy, through Chemistry and Biochemistry, to the Biological or Life Sciences. The science departments of the Faculty of Arts and Science offer courses in almost every band of this broad spectrum; these are designed not only for students who want to specialize in a particular science or group of sciences, but also for students who are interested in a less intensive study of a wider range of sciences, and for those whose primary interests lie in the Humanities or Social Sciences. For each of these groups there is opportunity to discover what prompts the specialist to follow a scientific discipline, what part science plays in the contemporary world, how it contributes to our welfare and modes of living and thinking, and what problems it raises and attempts to solve for this and succeeding generations.

The student who seeks a broad programme of many sciences, or who wants to specialize in a single one or in an interdisciplinary combination, should be aware of the interdependence of the sciences. For all of them Mathematics is an indispensable tool in developing logical frameworks of understanding from experimental data and in devising experimental tests of hypotheses. Specialists in Physics, Astronomy, and Physical Chemistry might require a greater breadth of competence in Mathematics than would specialists in the Biological or Life Sciences, but in these latter areas there are exciting opportunities for the application of Mathematics. Ecology, for example, presents such an opportunity. A glance at the section of this Calendar entitled "Suggested Programmes of Study" will show how Mathematics can be combined with other sciences; all such combinations are active fields of study today. Even in the most intensely mathematical of the sciences, it should be noted, there are differences of degree, depending on the student's inclination to theoretical or experimental aspects; certainly the student aiming at theory should take as much Mathematics as possible, without neglecting, of course, the basic science to which he wishes to apply his mathematical skills.

Computer Science, which formerly was listed under "Mathematics", has now been established as a separate department of the Faculty.

Geology and the Life Sciences are sometimes regarded as "derivative sciences" in the sense that their investigations of the earth and the organisms on it rest upon a basic foundation of Mathematics, Physics, and Chemistry. Preparation for these fields should begin, therefore, with a programme that includes Calculus, Chemistry, and Physics; those interested in the Life Sciences (i.e. Biochemistry, Biology, Botany, Microbiology, Physiology, and Zoology) should add BIO 110. Such a broad First Year programme will give the student entry into a science programme of any degree of speciality or generality in Second Year.

Students seeking a one- or two-year preparation for professional work in other Faculties such as Dentistry or Medicine are advised to consult those Faculties about their requirements.

Students who do not seek to specialize intensively may combine many science courses in various ways to suit their interests, both with reference to the subject matter and the depth to which it is probed. Those intending to take a majority of courses in the Sciences should note that without Mathematics in Grade 13 their choice will be severely limited.

FILM STUDIES

For the convenience of students interested in putting together a coherent programme of film studies, the courses relating to film are listed together in this section. All of these courses are described in detail elsewhere in the Calendar.

ENG 278, 474, FRE 385, 446, INI 214, 280, 304, INV 202, 302, ITA 240, REL 319

SUGGESTED PROGRAMMES OF STUDY

The following selection of suggested programmes of study is presented here primarily to show how programmes can be created so as to achieve a particular emphasis in some specific field. These give a recommended first-year programme, and, in many cases indicate programmes that would be devised by a student in his second, third and fourth year who wishes to specialize in a given discipline or certain combinations of disciplines. Many of these reproduce in the New Programme the degree of specialization that was present in many of the previous "Honour Courses"; some show new specialization opportunities that the New Programme's flexibility now makes possible.

The list below offers examples of what can be done: it is by no means complete; indeed one could not list all the variants that are possible within a given programme to achieve special emphasis in a particular aspect of the subject. In general, the programmes suggested below list fewer than the five courses that a year's programme must comprise; this is deliberate, for students may specialize and at the same time follow other interests not directly related to the field of specialization, or, alternatively, specialize even more completely, if they wish to do so.

B.A. PROGRAMMES

The following suggested programmes of study in Languages and Literatures, the Humanities and the Social Sciences lead to a Bachelor of Arts (B.A.) degree. They are listed alphabetically.

Although programmes are listed with the suggested year of study, students are free to deviate from this yearly sequence if course requisites and timetable permit.

CHINESE STUDIES (*Consult Department of East Asian Studies*)

The programme in Chinese Studies is intended primarily for students whose first language is not Chinese.

Each must take a minimum of five Chinese language courses and seven other East Asian Studies courses in art, history, literature and philosophy. Within the area of language study, a student may concentrate on either Literary Chinese or Modern Standard Chinese. Those choosing Modern Chinese will take EAS 100, 200 and 332; and at least one year of Literary Chinese, EAS 206; plus one of EAS 430, 431. If Literary Chinese is selected as the language of concentration a minimum of one course in Modern Chinese must be taken (EAS 100) as well as EAS 206, EAS 335 and two of EAS 432, 435, 438, 439, 440, 441. Apart from the basic number of required language courses, which are absolutely obligatory, it is the intention of the Department that there should be a high degree of flexibility in the possible areas of specialization. For example, a student who develops a strong interest in Chinese Literature or History may wish to substitute a Literature or History course offered by another department for one of the EAS options. This will be encouraged provided that such a choice contributes to a coherent and useful programme. Each student should consult with the departmental staff in order to ensure that his or her programme is well-balanced. Initial enquiries should be directed to the Undergraduate Secretary of the Department.

CLASSICS (*Consult Intercollegiate Department of Classics*)

First year: one course in each of GRK and LAT. Students with XIII GRK should take two of GRK 120F-123S; those with XIII LAT two of LAT 120F-123S.

Second year: two courses in each language in the 200-series.

Third and fourth years: two courses in each language in the 300/400 series. LAT 320 and LAT 323/420 must be included in the overall programme.

NOTES:

- (1) Courses in Modern Greek (GRK 150, 245, 250, 350, 450) may not be counted as part of this programme.
- (2) A student without secondary school GRK should take GRK 100 in first year and include two of GRK 120F-123S among his second-year choices. He may include a GRK 200-series course among his third-year courses.
- (3) A student with XII LAT but without XIII LAT should take LAT 130 in his first year and include two of LAT 120F-123S among his second-year choices.
- (4) A student without secondary school LAT should take LAT 100 instead of LAT 130.

ECONOMICS (*Consult Department of Political Economy*)

The programme in Economics requires standing in at least ten full courses in Economics, Mathematics and Statistics of which at least eight are in Economics, taken as part of a four year programme.

Students taking this programme must enrol annually with the Department of Political Economy during September. Completion of this programme leads to certification as a specialist in Economics.

First year: ECO 100 & MAT 134

Second, third and fourth years: students must take all of the following:

ECO 200/241S

ECO 202/240F

ECO 220/STA 232

ECO 325F & 326S *or* ECO 332

ECO 322

ECO 423

At least one course in Economic History (ECO 101 may be taken in first year)

ECONOMICS AND MATHEMATICS

See under B.Sc. Programmes, Mathematics and Economics.

ENGLISH (*Consult College Departments of English*)

For this twenty-course programme a student is required:

- (a) to take at least ten and not more than fifteen courses in ENG,
- (b) to achieve an average of B or better in the basic programme of the ten courses (as set out below), and
- (c) to complete at least five courses outside the Department of English by the end of his fourth year.

The basic programme of ten courses consists of one course from each of the following groups:

ENG 200/300/312/404

ENG 206/302/304/413

ENG 212/332

ENG 108/328/338/348/419

ENG 306/415

ENG 207/308/346/368/417

ENG 322/324

ENG 150/152/218/256/351/354

ENG 466/467/469

One other course in ENG not in any of the above groups or a second course from any of the preceding groups.

A student's basic programme may not include more than two 100-series courses.

This programme leads to specialist certification.

ENGLISH AND ONE OTHER SUBJECT (*Consult Departments of English, and of the other subject*)

This programme is recommended for double teaching certification.

One course from each of the first four groups listed above and one course from each of the following groups:

ENG 306/322/415

ENG 207/308/324/346/368/417

One other course in ENG not in any of the above groups or a second course from any of the preceding groups.

A student's basic programme may not include more than two 100-series courses.

ENGLISH AND LATIN (*Consult Departments of English and Classics*)

First year: LAT: as under Classics

Second year: LAT: two courses in the LAT 200-series

Third year: LAT: two courses in the LAT 300/400-series

Fourth year: LAT: two courses in the LAT 300/400-series

NOTE: LAT 320 and LAT 323/420 must be included in the overall programme. For the English requirements see the programme for English and One Other Subject.

FINE ART—HISTORY OF ART (*Consult Department of Fine Art*)

The total programme requires at least eight and not more than thirteen courses in History of Art. By the end of the second year students should have acquired a reading knowledge of two of French, German and Italian; FRE 111, GER 106Y, 205, and ITA 100 are specifically recommended.

First year: FAR 200 and not more than two of FAR 100, 101, 102

Second year: FAR 201 and any of FAR 100, 101, 102 not already taken

Second-, third- and fourth-year programmes should include at least four of FAR 202, 220, FAR 300- and 400-series courses in History of Art; EAS 226, 425F; ISL 105S/311; NES 281F, 282S, 481; SIS 370F, 371S

FINE ART—STUDIO (*Consult Department of Fine Art*)

The programme in Studio requires at least eleven and not more than thirteen FAR courses, of which four must be in History of Art and at least seven should be in Studio work. (Not more than two studio courses should be taken in any given year.)

First year: FAR 101, 102, 110

Second year: FAR 200, 230, 235

Third- and fourth-year programmes should include FAR 201, any of the courses above not already taken, and five of FAR 330, 332, 333, 335, 430, 432.

FRENCH LANGUAGE AND LITERATURE (*Consult College Departments of French*)

The department certifies as specialists in French students who request such certification and who meet the department's requirements. The specialist programme requires standing in a minimum of ten FRE courses taken as part of a four-year programme. No more than two full courses may be from each of the following groups: a) FRE 120-142; b) FRE 290-291F/S/Y, 390-391F/S/Y, 490-491F/S/Y; c) FRE 425-469. At least two full courses must be from the following upper level courses: FRE 316, 318, 332, 344, 346, 368, 371, 375, 390, 391F/S/Y, 425-469, 471, 474, 476, 490, 491F/S/Y. A mark of at least 70% must be achieved in each of at least seven FRE courses. It is highly recommended that a student take at least four courses outside the French Department. In addition, a student must meet the following requirements:

(1) In language proficiency:

(a) pass a special University examination in written French; and

(b) pass a University oral examination. (Normally both of these are taken in the Third Year.)

(2) In French linguistics successfully complete at least one full course from FRE 372, 373, 374, 375, 476 or Independent Study (FRE 290-291F/S/Y, 390-391F/S/Y, 490-491F/S/Y) or an Inter-College Option (FRE 425-469) on a linguistic or stylistic topic. (Students planning a teaching career are strongly encouraged to take FRE 372).

(3) In literature successfully complete at least four full courses (not including FRE 120), one of which must be primarily devoted to texts prior to 1800, and one of which must be primarily devoted to texts after 1800.

Subject to the usual prerequisites, the above requirements may be fulfilled in any order the student wishes and the number of French courses taken each year may be determined by the student. None of FRE 100/200/300 or FRE 111 may be counted among the ten courses required for specialization; however, FRE 111 does meet the prerequisite for FRE 120. The French Department recommends the following programme:

First year: FRE 120 & FRE 140/142. Students intending to take upper-level literature courses are urged to take FRE 140/142.

FRENCH LANGUAGE AND LITERATURE (*Continued*)

Second year: two or more courses from the courses listed as “Courses open to second- and higher-year students” (except FRE 200 & 300).

Third year: two or more courses from the courses listed as “Courses open to second- and higher-year students” (except FRE 200 & 300) and “Courses open to third- and higher-year students”.

Fourth year: two or more courses from courses listed as “Courses open to second- and higher-year students” (except FRE 200 & 300), “Courses open to third- and higher-year students”, and “Courses open to fourth-year students.” Care should be taken to avoid selecting courses which duplicate the content of previous or concurrent courses.

FRENCH AND ANOTHER SUBJECT (*Consult College Departments of French, and of the other subject*)

The requirements for double-specialization in French and another subject (e.g. in Modern Languages and Literatures) are the same as above, except that a minimum of seven courses in French is required, of which at least three must be literature courses. Only one Independent Study and one Inter-College Option may be counted towards specialization. A mark of at least 70% must be achieved in each of at least five FRE courses.

FRENCH AND LATIN (*Consult College Departments of Classics and French*)

First year: LAT: as under Classics; FRE 120 and FRE 140/142

Second year: LAT: two courses in the LAT 200-series; two or more courses in FRE from those listed as “Courses open to second- and higher-year students” (except FRE 200 and 300)

Third year: LAT: two courses in the LAT 300/400-series; two or more courses in FRE from those listed as “Courses open to second- and higher-year students” (except FRE 200 and 300) and “Courses open to third- and higher-year students”

Fourth year: LAT: Two courses in the LAT 300/400-series; two or more courses in FRE from those listed as “Courses open to second- and higher-year students” (except FRE 200 and 300), “Courses open to third- and higher-year students”, and “Courses open to fourth-year students”

NOTE: LAT 320 and LAT 323/420 must be included in the overall programme.

GEOGRAPHY (*Consult Department of Geography*)

The specialist programme requires the equivalent of nine full courses in GGR including GGR 270, 320, 390F/391F/392F, and GGR 491. This core of courses is designed so that a student may fulfil at least one course unit of the programme in each of his last three years. For recommended sequences, see the essay under the subject “Geography”. Completion of the programme in Geography will be formally acknowledged on the student’s transcript. The key course in the programme is GGR 491. All other courses should be regarded as affording the necessary background to undertake successfully the preparation and writing of the research paper.

GERMAN LANGUAGE AND LITERATURE (*Consult College Departments of German*)

First year: GER 110, 120. (GER 120/130 acceptable)

Second year: GER 210 and GER 220/230

Third and fourth years: programmes each include two GER courses numbered above 300, and GER 326F must be included in one of these years

This programme of studies leads to certification as a specialist in German, but those desiring specialist standing should check their choice of courses with departmental chairmen.

GREEK (*Consult Intercollegiate Department of Classics*)

First year: GRK 100/two of GRK 120F-123S (See under Classics)

Second year: two courses in GRK and one in LAT 200-series

Third year: three courses from GRK 320-322, 420-430Y or two courses from GRK 320-322, 420-430Y and GRK 220/(222F/223S); and one approved course in LAT

Fourth-year: three courses from GRK 320-322, 420-430Y of which at least one must be of 400-series; and one approved course in LAT

GREEK AND ANOTHER SUBJECT (*Consult Undergraduate Secretary of Classics, and of the other subject*)

The GRK portion of such a double programme is in principle the same as the GRK component of the Classics programme. Programmes other than Classics already approved include:

- (a) Greek and English
 - (i) GRK: as under Classics
 - (ii) ENG: as under English and One Other Subject
- (b) Greek and Philosophy
 - (i) GRK: as under Classics, except that GRK 321 & 421 must be included
 - (ii) PHL: six or seven courses (See Department of Philosophy *Handbook*)

GREEK AND ROMAN HISTORY (*Consult Intercollegiate Department of Classics*)

Students wishing a three-year degree should take two GRH courses in each of second and third year, together with four courses in GRK and LAT with at least one in each language. Students wishing a four-year degree should take two GRH courses in each of second, third and fourth year, together with a total of six courses in GRK and LAT (at least one in each language to be completed by the end of the third year). Students intending graduate work in this area should consult the Chairman of the Intercollegiate Department of Classics at an early stage of their studies.

HISTORY—MODERN HISTORY (*Consult Department of History*)

The programme consists of an academically coherent combination of courses chosen after consultation with departmental advisers so as to meet the following requirements:

- (a) a minimum of nine courses in HIS (courses from other departments—normally not more than three—may be substituted for HIS courses with the approval of the Programme Committee);
- (b) the nine courses to be chosen from a minimum of three areas of study (e.g. Canadian, British, American history, etc.);
- (c) in each of two areas a minimum of two 300- or 400-series courses must be chosen;
- (d) of the nine courses at least two must deal exclusively with periods preceding the year 1815.

(The former Specialist regulations, seven courses in HIS not including HIS 100, continue to apply to students who entered the University in September 1969, or before.)

First year: one 100-series course

Second year: two or more HIS courses

Third year: at least two 300- or 400-series HIS courses

Fourth year: at least two 300- or 400-series HIS courses

INDIAN STUDIES

See Sanskrit and Indian Studies

ISLAMIC STUDIES (*Consult Department of Islamic Studies*)

The total programme requires a minimum of nine courses in ISL, of which at least three shall be language courses. REL 408F (Pre-Islamic Arabia) may be counted.

Students who intend to enrol in this programme are urged to contact the Undergraduate Secretary as soon as possible, and in any case not later than the end of their first year.

Recommended first-year preparation: ISL 214

ITALIAN (*Consult Department of Italian and Hispanic Studies*)

The programme requires nine courses in Italian.

First year: ITA 100/110/152/153Y

Second year: two 200-series ITA courses, including ITA 250/251/252Y/253Y

Third and fourth years: six ITA courses, including ITA 321, one full course or equivalent on the Renaissance and, for non-matriculants, ITA 350.

A student who completes the above programme will be certified as a specialist in Italian.

ITALIAN AND ANOTHER SUBJECT (*Consult Departments of Italian and Hispanic Studies, and of the other subject*)

Seven courses in Italian must be taken.

As under the Italian programme with only four ITA courses required in third and fourth years together, which must include ITA 321 and one full course or equivalent on the Renaissance.

A student who completes the above programme will be certified as a specialist in Italian in a dual specialization programme.

Students in Italian and Latin should include LAT 320 and LAT 323/420.

See also Languages and Literatures.

JAPANESE STUDIES (*Consult Department of East Asian Studies*)

The programme in Japanese Studies is intended for students whose first language is not Japanese. Students whose first language is Japanese are advised to do most of their undergraduate work in other disciplines and specialize in the study of Japan in the School of Graduate Studies.

Language study is the core of the programme: in the first three years the courses in elementary, intermediate, and advanced modern Japanese must be completed, along with at least one course in classical Japanese; in the fourth year an additional course must be taken in each of modern and classical Japanese. In addition, students must select at least six other East Asian Studies courses in literature, history, philosophy, art, music. It is recommended that courses on China be taken by Japanese specialists, and one or two of these may be included in the required six courses; otherwise they may be included in the remainder of the student's programme.

Certain courses offered by other departments, such as Anthropology, Geography, History, Political Economy, Religious Studies, Sanskrit and Indian Studies, and Sociology, may also be counted in Japanese Studies. Students should consult with the Department of East Asian Studies concerning these courses.

In cases where students have acquired knowledge of Japanese through previous study or residence in Japan, they may be admitted to advanced language courses after consultation with the instructors.

It is strongly recommended that students with no experience of Japanese life undertake some of their studies in Japan. Arrangements can be made under the Study Elsewhere Programme for formal credit for study done at a Japanese university. Normally studies abroad are done in the third year of a student's programme.

Summary of minimum requirements: total twelve courses

First year: Introductory Modern Japanese	} <i>In addition</i> six other East Asian Studies courses
Second year: Intermediate Modern Japanese	
Third year: Advanced Modern Japanese	
Classical Japanese	
Fourth year: Modern Japanese	
Classical Japanese	

JEWISH STUDIES (*Consult Professor M. Wasserman, Undergraduate Secretary, Jewish Studies Programme, University College*)

First year: NES 142, 262

Second year: NES 242/243 (for students with XIII Hebrew)

Third year: NES 243 (for those who have taken NES 242)/(NES 343F & 344S) or (346F & 347S) (for those who have taken NES 243)

In second and third years, four full courses from the offerings of the programme

Fourth year: NES 444, 445, one of NES 441, 442, 451, HIS 406

See also essay under Near Eastern Studies and the brochure available from the Department of Near Eastern Studies.

LANGUAGES AND LITERATURES

Many programmes can be devised which combine modern languages, ancient languages, or modern and ancient languages together. The pattern for such combinations could be basically the same, i.e. two courses (where offered) in each of the two languages chosen in each of the second, third and fourth years, the fifth course remaining a free choice.

- (a) Courses are offered (not all in three or four year sequences) in the following modern languages: Arabic, Chinese, Czech (& Slovak), English, French, German, Greek, Hebrew, Hindi, Italian, Japanese, Marathi, Mohawk, Persian, Polish, Portuguese, Russian, Serbo-Croatian, Spanish, Turkish, Ukrainian, Yiddish.
- (b) Courses are offered (not all in three or four year sequences) in the following ancient languages: Akkadian, Classical Arabic, Aramaic-Syriac, Chinese, Egyptian, Greek, Hebrew, Classical Japanese, Latin, Pali, Sanskrit, Slavonic.
- (c) Interesting combinations can be devised within (a), within (b), or by combining courses from (a) and (b).
- (d) Courses are offered also in Linguistics and in joint Anthropology and Linguistics.

The Department of Education lists a number of combinations of language courses which lead to Interim High School Assistant's Certificates, Type A. See the section of this calendar entitled Type A Certification.

LATIN (*Consult Intercollegiate Department of Classics*)

First year: one course in GRK and one in LAT (See under Classics)

Second year: two courses from LAT 200-series, one course from GRK 200-series

Third and fourth years: three courses from LAT 300/400-series, one approved course in GRK. LAT 320 and LAT 323/420 must be included in the overall programme

LATIN AND ANOTHER SUBJECT (except GREEK) (*Consult Undergraduate Secretary of Classics, and of the other subject*)

First year: one course in LAT (See under Classics)

Second year: two courses in the LAT 200-series

Third year: two courses in the LAT 300/400-series

Fourth year: two courses in the LAT 300/400-series

NOTE: LAT 320 and LAT 323/420 must be included in the overall programme

Approved programmes other than Classics include:

- English and Latin
- French and Latin
- Italian and Latin
- Spanish and Latin

LATIN AMERICAN STUDIES (*Consult Department of Italian and Hispanic Studies*)

First year: GGR 100/101/102/220; HIS 101; SPA 100/120. One of ANT 100, 150; ECO 100; JAL 100; POL 101/103; SOC 101

Second year: GGR 242; HIS 290; SPA 220/221Y and SPA 280Y. One of ANT 204*; FRE 120; JAL 100; ECO 200; POL 200*, 208, 305; PRT 100/200; SOC 201*, 203, 210; STA 222

Third year: PRT 100/200; SPA 320.

Two of ANT 340; ECO 324, 328; GGR 101, 102, 220, 222, 224; HIS 393F, 394S; POL 305S, 320; SOC 301, 302, 304, 305, 307, 311, 313, 315, 323

Fourth year: PRT 220; SPA 420Y and one of SPA 380F, 381S, 461F, 466S, 470S, 482F, 484S, 486F. Two of ANT 441, 443; ECO 324, 328; GGR 102, 210, 220, 222, 224; HIS 393F, 394S, 491; POL 417; SOC 401, 402

NOTE: Students should consult the Departments concerned when making their choice; courses marked with an asterisk (*) are strongly recommended if later specialized work in one of the disciplines is contemplated. Students may also emphasize one or two of their disciplines by doubling or tripling courses in any year.

LINGUISTICS (*Consult Professor J.K. Chambers, Centre for Linguistic Studies*)

There is no fixed programme in Linguistics alone. Instead, appropriate programmes are created (with advice when asked for) by the students, who are encouraged to combine Linguistics and some convergent area(s) such as ancient and modern languages, anthropology, computer science, English, mathematics, philosophy, psychology, etc. Five or six LIN and JAL courses comprise the normal component for a combined programme. The admission requirements for the one-year M.A. programme in Linguistics are: JAL 100, LIN 228F & 229S, 230, and three other LIN or JAL courses in a four-year undergraduate degree.

LINGUISTICS AND MATHEMATICS

See under B.Sc. programmes, Mathematics and Linguistics

MODERN LANGUAGES AND LITERATURES

See Languages and Literatures

MUSIC (*Consult Professor T. Kenins, Faculty of Music*)

First year: MUS 100/120, 140; GER 100/120/130; HIS 102

Second year: MUS 222, 240; ITA 100/LAT 100; PHL 203S; GER 205 (if GER 105/106Y was taken in the previous year)

Third year: MUS 322, 327, 340; courses numbered 350 and above are especially recommended

Fourth year: MUS 422, MUS 443; courses numbered 450 and above are especially recommended.

NEAR EASTERN STUDIES (*Consult Department of Near Eastern Studies*)

The Department of Near Eastern Studies encompasses the following major geographical areas: Egypt, Syria-Palestine, and Mesopotamia. The life and culture of these areas is studied through the languages and literatures of each of these areas, its history, and archaeology. Because of the variety and complexity of the knowledge about the subject area, both ancient and modern, the Department offers five specialist programmes. The underlying purpose of a specialist programme in this Department is to enable a student to build a coherent body of knowledge in a selected area. There is a large degree of flexibility in the first year so that a student may actually begin specialization in the second year. A minimum of twelve courses may be taken but the Department recommends that a student select the additional courses outside the Department in order to develop a well-rounded B.A. programme. Normally a specialist programme is expected to cover four years.

The following programmes are recommended as the basic minimum requirement for specialization:

EGYPTOLOGY

First year: NES 100/101

Second year: NES 231, 271/272, 281F, 282S

Third year: NES 331, 271/272, 371

Fourth year: NES 431, 471, 481

Plus two courses in either Classical Greek or Biblical Hebrew to be started by the third year.

ASSYRIOLOGY

First year: NES 100/101

Second year: NES 141/142, 271/272, 281F, 282S

Third year: NES 211, 241, 271/272, 371

Fourth year: NES 311, 341, 471, 481

NEAR EASTERN STUDIES (*Continued*)

ANCIENT SYRIA-PALESTINE

First year: NES 100/101, 141

Second year: NES 241, 271/272, 280

Third year: NES 341, 271/272, 371, 221/251

Fourth year: NES 441/442/445, 471, 321/351, 481

HELLENISTIC STUDIES

First year: NES 100/101/INV 102

Second year: GRK 100; GRH 200; NES 280

Third year: NES 141, 251, 371; REL 303

Fourth year: NES 241, 351/451, 471, plus one course to be selected in consultation with the Departmental Undergraduate Secretary.

MEDIÆVAL AND MODERN HEBREW

First year: NES 142; HIS 206

Second year: NES 242/244, 262, 221/ISL 214

Third year: NES 243, 343F, 344S, 321/ISL 220

Fourth year: NES 346F, 347S, 444; HIS 406; REL 320/NES 261

N.B. Students entering with NES 142 or its equivalent will take NES 242.

PHILOSOPHY (*Consult University Department of Philosophy*)

The total programme requires the successful completion of eighteen half-courses in Philosophy (100-level courses count as two half-courses), at least half of which must be drawn from above the 200 level. A good specialist programme will include some work in each of the following areas: epistemology, metaphysics, logic, ethics or political philosophy, ancient philosophy, early modern philosophy (17th and 18th centuries), recent philosophy (19th and 20th centuries). A list of courses in each of these areas may be found in the departmental *Handbook*. The Department also recommends that Philosophy specialists include at least two Special Tutorials in their programmes.

The Department maintains an extensive counselling service, and students who wish programme counselling are urged to take advantage of it.

In addition to its specialist programme, the Philosophy Department has developed, in cooperation with other departments in the Faculty, a number of Joint programmes, each of which combines study in philosophy and one other discipline. A list of such programmes follows.

PHILOSOPHY AND BIOLOGY (*Consult Departments of Philosophy and Zoology*)

The Philosophy component of the programme is as follows:

First year: PHL 100

Second year: PHL 240F, 241S, 250S, 271F, 272S

Third year: PHL 243F, 244S, 370F, 470F/472S; one of PHL 300S, 320S, 360S

Fourth year: PHL 472S/470F; and two additional PHL courses

For the biology component of the programme, students should consult the Department of Zoology (*Prof. R.C. Plowright*).

The programme will include individual studies work in the fourth year (ZOO 498), under the joint supervision of members of the Philosophy Department and the Zoology Department.

PHILOSOPHY AND GREEK

See Greek and Philosophy

PHILOSOPHY AND MATHEMATICS

See B.Sc. programmes, Mathematics and Philosophy

PHILOSOPHY AND PHYSICS (*Consult Departments of Philosophy and Physics*)

This programme is designed to provide a basic background in both philosophy and physics, and an opportunity to explore their interrelations.

First year: MAT 139; PHL 100; PHY 150

Second year: MAT 239, 244F, PHL 243F, 244S, 250S, 271F, 272S; PHY 250, 252F

Third year: MAT 334F; APM 346S; PHL 370F, 470F/471S; two of PHL 320S, 350S, 360S; PHY 350, 351F

Fourth year: PHL 471S/470F and two additional PHL courses; two of PHY 450, 451, 452; PHY 471 (under joint supervision of members of the Departments of Philosophy and Physics)

PHILOSOPHY AND RELIGIOUS STUDIES

See Religious Studies and Philosophy

PHILOSOPHY (ST. MICHAEL'S COLLEGE)

See essay under PHI—Philosophy (St. Michael's College)

POLITICAL SCIENCE (*Consult Department of Political Economy*)

The programme requires standing in at least ten courses in Political Science, of which at least eight must be 200- or higher-series courses, taken as part of a four-year programme. Students taking this programme must enrol with the Department of Political Economy during September. Completion of this programme leads to certification as a specialist in Political Science.

First year: POL 100/101/102/103/104 or two of these courses.

Students will find ECO 100 particularly useful.

Second, third and fourth years: students must include the following in their programmes:

(a) at least two courses in Political Theory from POL 200, 307, 320, 329, 330, 400, 401, 403, 421, 424, 427

(b) at least one course from each of four of the following five fields:

Comparative Politics (Developed Countries)

Comparative Politics (Developing Countries)

International Relations

Political Behaviour

Canadian Government and Public Administration

PORTUGUESE

See Latin American Studies

RELIGIOUS STUDIES (*Consult Combined Departments for Religious Studies*)

Specialist certification is reserved for those whose curricular base is primarily within the courses of the Combined Departments, who have demonstrated a versatility within religious studies, a special degree of sophistication within at least one area of the discipline, and a high standard of performance.

Specifically, the programme requires a minimum of ten courses in Religious Studies or officially recognized equivalents, including demonstrated ability in courses falling in a limited number of specified areas and in a field of special concentration. The further details of specialization requirements may be found in the Religious Studies brochure, published in the spring and available through College Departments of Religious Studies, College Registrars, and the Academic Secretary of the Combined Departments. Students contemplating specialization should contact the Academic Secretary.

RELIGIOUS STUDIES AND PHILOSOPHY (*Consult Combined Departments of Religious Studies, University Department of Philosophy, or St. Michael's College Department of Philosophy*)

This programme provides the student with an opportunity to achieve specialist certification in both Religious Studies and Philosophy. In one form the programme involves the

RELIGIOUS STUDIES AND PHILOSOPHY (*Continued*)

collaboration of the Combined Departments for Religious Studies and the University Department of Philosophy; and it requires six course-equivalents in Religious Studies, six course-equivalents in Philosophy, one additional course-equivalent in either Religious Studies or Philosophy, plus a substantial paper. In an alternative form the programme involves the collaboration of the St. Michael's College Department of Religious Studies and Philosophy; and it requires six course-equivalents in Religious Studies, six course-equivalents in Philosophy, plus INM 380 and INM 480. For further information about this programme, including a list of the specific courses or course-areas which must be covered, please consult the bulletins of the Combined Departments for Religious Studies, the University Department of Philosophy, or the St. Michael's College Department of Philosophy.

RUSSIAN LANGUAGE AND LITERATURE (*Consult Department of Slavic Languages and Literatures*)

The programme requires ten SLA courses over four years.

First year: SLA 100/121

Second, third and fourth years: the core of six other courses consists of SLA 220, 240, 320, 340, 420/421, 440. Students proceeding from SLA 121 must substitute one 300- or 400-series Russian course for SLA 220. In addition, any three courses in Russian are required.

NOTE (1) The seven Russian "core" courses listed above are the requirement for the Russian component in double-specialization.

NOTE (2) An average of 70 per cent will be required in 300- and 400-series courses.

SANSKRIT AND INDIAN STUDIES (*Consult Department of Sanskrit and Indian Studies*)

The minimum requirements for specialist certification in Sanskrit and Indian Studies are as follows:

First year: SIS 110

Second year: SIS 210 and one other course in SIS

Third year: SIS 310 and two other courses in SIS

Fourth year: SIS 410 and two other courses in SIS

The courses taken by students specializing in Sanskrit Language or Sanskrit Literature should include SIS 220, 320 and 420.

SLAVIC LANGUAGES AND LITERATURES (*Consult Department of Slavic Languages and Literatures*)

The programme requires eleven SLA courses over four years.

First year: SLA 100/121, one of SLA 205-208, 211, 215-218. Students without XIII Russian should take SLA 100, one of SLA 211, 215-218.

Second, third and fourth years:

(a) The remainder of the seven core courses listed under "Russian Language and Literature"

(b) Three courses, including one 400-series course, in another Slavic Language and Literature (Czech, Polish, Serbo-Croatian or Ukrainian)

(c) One course chosen from SLA 211, 212, 213, 215-218, 311, 312, 313, 316, 330, 332, 341, 342, 361, 362S, 363F, 364S, 430, 431, 442, 443. Note however that only one of SLA 215-218 may be counted toward the required eleven courses.

NOTES (1) An average of 70 percent will be required in 300- and 400-series courses.

(2) No student may include in his five-course programme for standing in any year more than two of the following language courses offered by the Department: SLA 100/121, 205, 206, 207, 208, 220, 305, 306, 307, 308, 320/321 (1972-73) 420/421.

(3) No two Slavic Languages may be *begun* in the same academic year, that is no two of SLA 100, 205, 206, 207, or 208 may be taken concurrently. In rare cases, where a particular academic programme warrants it, exceptions may be made by the Undergraduate Secretary of the Department.

SOCIOLOGY (*Consult Department of Sociology*)

Programmes may be selected within the discipline of Sociology. Students are encouraged to combine their Sociology courses with those offered in other disciplines or the interdisciplinary programme. Subject themes which lend themselves to this approach include Canadian Society, Interpersonal Relations, Political Sociology, Social and Economic Organization, Urban Studies, Environmental Studies, Comparative Social Organization and Latin American Studies. Many other combinations are possible, and can be arranged in consultation with the Sociology Department and other departments concerned. Students who wish to concentrate on a special area of Sociology should consult the Supervisor of Undergraduate Studies about their programmes.

The Programme in Sociology requires four full years. Students who wish to complete this programme should enrol in the Department of Sociology at the beginning of their Third and Fourth Years. A minimum of seven courses in Sociology is required, including SOC 203/313/401, as well as SOC 200/201 or both, and at least two 300- or 400-series SOC courses. The following courses will be regarded as an equivalent of SOC 201 in satisfying the requirement: STA 222, ECO 220, GGR 270. The following courses will be regarded as equivalents of 300- or 400-series SOC courses: PHL 314S (Philosophy of Social Science), REL 416F (Religion and Alienation), and REL 417S (The Changing Concept of Secularization). In addition, REL 205 (Sociology of Culture and Religion) will be considered as an equivalent of a 200-series SOC course.

Completion of the Programme in Sociology will be formally acknowledged on the student's transcript. Students contemplating entrance to a Type A certificate programme at the Faculty of Education should complete at least *nine* courses in four years.

NOTE: Students who were in their Third Year in 1972-73 may be considered to have completed the specialist programme in Sociology under the regulations specified in the 1971-72 Calendar.

SPANISH (*Consult Department of Italian and Hispanic Studies*)

The programme requires nine courses in Spanish.

First year: SPA 100/120

Second year: SPA 220/221Y; two or three of SPA 225Y, 236S, 246F, 256Y, 280Y, 150 (if not taken in first year)

Third and fourth years: SPA 320, 350, 420Y, 425Y; two of SPA 356Y, 380F, 381S, 436S, 446S, 456Y, 461F, 466S, 470S, 482F, 484S, 486F

Two additional courses in Spanish must be taken, excluding SPA 195Z, 200, 300

A student who completes the above programme will be certified as a specialist in Spanish.

SPANISH AND ANOTHER SUBJECT (*Consult Department of Italian and Hispanic Studies, and of the other subject*)

Seven courses in Spanish must be taken, excluding SPA 195Z, 200, 300.

Students are advised to follow the programme listed above.

A student who completes the above programme will be certified as a specialist in Spanish in a dual specialization programme.

See also Languages and Literatures, Latin and another subject, and Latin American Studies.

B.SC. PROGRAMMES

The following suggested programmes of study in Mathematics, the Physical Sciences and the Life Sciences lead to a Bachelor of Science (B.Sc.) degree if the required number of science courses are included in the overall programme. (See the section of this calendar entitled "Requirements for Standing".) Programmes are arranged alphabetically.

Although programmes are listed with the suggested year of study, students are free to deviate from this yearly sequence if course requisites and timetable permit.

ACTUARIAL SCIENCE (*Consult Professor P.L.J. Ryall, Department of Mathematics*)

This programme is designed to prepare a student for professional work as an actuary.

First year: MAT 134/135/139/150

Second year: ACT (223F & 233S); one of MAT 234/235/239/250; STA 232/252; (ECO 240F & 241S are recommended)

Third year: ACT (323 & 333); STA (332F & 342S & 347S)

Fourth year: ACT (423 & 433); STA 352 is recommended

ASTRONOMY AND ASTROPHYSICS (*Consult Departments of Astronomy and Physics*)

First year: PHY 150; MAT 139/140 and 150

Second year: PHY 250, 251S, 252F; MAT 239, 244F; APM 346S

Third year: AST 300, 310Y; PHY 350, 351F, 353S; MAT 334F

Fourth year: AST 400, 410Y; PHY 352, a further selection of courses in the 400-series

BIOCHEMISTRY (*Consult Department of Biochemistry—Faculty of Medicine*)

First and second years: BIO 100/110/120; CHM 120, 220/221, 240/241; MAT 130/135/139/150

Third year: BCH (321 & 371Y); CHM 340/341

Fourth year: BCH 471, three of BCH 421-426

BIOCHEMISTRY AND CHEMISTRY

See under Chemistry and Biochemistry

BIOLOGY (*Consult Departments of Botany and Zoology*)

A programme in Biology is suggested for students who plan to work in the broad field of Biology rather than in a biological subdiscipline. This programme is particularly appropriate for students planning careers in teaching Biology.

First year: BIO 110 (replaced BIO 100 & 120 of former years); CHM 120; MAT (other than MAT 120); PHY 110/111/130

Second year: five courses, with at least one in Botany and one in Zoology recommended

Third and fourth years: five courses in each year, with a year total of at least two courses in each of Botany and Zoology recommended. Students are urged to choose some of their courses from such cognate fields as Organic Chemistry, Biochemistry, Microbiology. Students are urged to take at least one of the two field courses, BIO 300F and BIO 301F.

BIOLOGY AND MATHEMATICS

See under Mathematics and Biology

BOTANY (*Consult Department of Botany*)

First year: BIO 100/110/120/BOT 100; CHM 120; MAT 130/135; PHY 110/111/130

Second year: at least two of BOT 201, 210, 220, and 240, a CHM 200-series course; selection from other BOT and ZOO courses, MBL 200, PHY 230. Students are advised to register at the end of second year for one of the field courses, BIO 300F/301F

Third year: at least two BOT courses selected from the 200 and 300 series and two additional courses from BOT, ZOO, MBL, BCH 320/321; STA 232/252. Students are advised to register for the alternate field course at the end of the third year.

Fourth year: a selection of courses to be chosen in collaboration with the Botany staff

CHEMICAL PHYSICS (*Consult Departments of Chemistry and Physics*)

First year: CHM 120; MAT 139/(140 & 150); PHY 150

Second year: CHM 220/221, 230S or 240/241; MAT 239, 244F, APM 346S; PHY 250, 251S

Third year: CHM 320/321, 230S or 240/241 (whichever not taken previously); MAT 319S/334F; PHY 226Y, 350, 351F

Fourth year: PHY 326Y/327F/328S; plus a minimum of three 400-series PHY/CHM courses with at least one from CHM and one from PHY

CHEMISTRY (*Consult Department of Chemistry*)

First year: CHM 120; MAT 135/139/(140 & 150); PHY 130/150

Second year: CHM 220/221, 230S, 240/241; MAT 235/239 (it is recommended that PHY 230/250 be included in either the second- or third-year programme)

Third year: CHM 320/321, 330, 340/341; one course in CHM/another science/MAT

Fourth year: Three 400-series courses in CHM; one course in CHM/Science/MAT

CHEMISTRY AND BIOCHEMISTRY: (*Consult Departments of Chemistry and Biochemistry—
Faculty of Medicine*)

First year: BIO 100/110/120; CHM 120; MAT 135/139; PHY 130/150

Second year: CHM 220/221, 230S, 240/241; MAT 235/239. Students should consider a BOT or ZOO as a fifth course. In addition PHY 230/250 is recommended for inclusion in either the second- or third-year programme

Third year: BCH 320/321, 371Y; CHM 340, 347S, 320/321/330

Fourth year: Four courses in BCH or CHM (mostly organic) at least three of which should be 400-series

CHEMISTRY AND MATHEMATICS

See under Mathematics and Chemistry

CHEMISTRY (WITH PHYSICS) (*Consult Department of Chemistry*)

First year: CHM 120; MAT 139/(140 & 150); PHY 150/130

Second year: CHM 220/221, 230S and/or (240/241); MAT 239, 244F; APM 346S

Third year: (1973–74): CHM 320/321, 323S, 230S or (240/241) (if not taken previously), 330/340/341; (APM 331F, MAT 319S)/(MAT 244F, 334F, APM 346S); PHY 251S/other PHY

(1974–75): CHM 320/321, 230S or (240/241) (if not taken previously), 330/340/341; MAT 334F; PHY 250, PHY 251S/other PHY

Fourth year: two 400-series CHM courses; one 300/400 series PHY course; CHM 330/340/341/another 300 or 400 series CHM or PHY

NOTE: For a balanced training in Chemistry students should take each of CHM 320/321, 330, 340/341

COMPUTER SCIENCE (*Consult Mrs. M. Chepely, McLennan Laboratories, Room 1317, Department of Computer Science, 928-6360*)

A programme to prepare the student for professional or graduate work in Computer Science.

First year: CSC 148F, 158S; MAT 139/150

Second year: CSC 228S, 258F, 248S; MAT 224F, 239; STA 232; suggested options are CSC 208S; MAT 244F/APM 251

Third year: CSC 348F/MAT 345; CSC 351S, 368S, 378F; MAT 319S/STA 347S; suggested options are CSC 358S; ELE 459F; MAT 344S

Fourth year: CSC 438F, 448S, 468F; suggested options are APM 451F, 456S; CSC 441F, 446S, 478S; MAT 464F

COMPUTER SCIENCE FOR DATA MANAGEMENT (*Consult Mrs. M. Chepely, Department of Computer Science*)

A programme to prepare the student for a career in information systems development, an area of increasing importance to business; industry and government, or graduate work in Computer Science.

First year: COM 100; CSC 148F, 158S; ECO 100/102; MAT 134/135/139

Second year: COM 221F, 222S; CSC 258F, 248S, 228S; MAT 225/224F, 234/239; suggested option is CSC 208S

Third year: CSC 334F, 344S, 348F/MAT 344S; ECO 240F, 241S; STA 232; suggested options are COM 336S, 401; CSC 351S/236S

Fourth year: CSC 364S, 434F, 444S; suggested options are APM 451F; COM 331, 400

GEOLOGY (*Consult Professors Beales, Fawcett, Norris or Gittins, Department of Geology*)

(telephone 928-3021 for appointment)

By the end of the fourth year, the student intending to enter the profession of geology should have completed at least 9½ courses in geology (including some 400-series courses) and at least 5½ courses in other sciences and mathematics

First year: CHM 120; CSC 148F/(108F/Y); GLG 120; MAT 130/134/135/139 and a selection from AST 100; BIO 100/110/120; GLG 102, 121F; PHY 130/150

By the end of the third year, the following should have been completed (minimum requirement 15 courses):

(a) 5½ courses in Geology consisting of: GLG 120, 220, 320, 321F, 322 and at least one of GLG 222, 324, but preferably both

(b) at least 5½ additional courses selected from: BIO 100/110/120; BOT 210; CHE (217F & 218S)/CHM 230S; CHM 120, 220/221; CSC 148F/(108F/Y); MAT 130/139, 230/239; PHY 130/150, 230/(250 & 251S); ZOO 220, 250, 253

Other desirable courses for enrichment of the basic programme include: AST 100/120; GGR 301, 311S; GLG 102, 121F, 221S, 323Y, 327S, 328, 370Y, 371Y, 372Y; PHY 225F (324Y & 338); ZOO 464

Fourth year: at least four geology courses from the 300- and 400-series

GEOLOGY AND PHYSICS

See under Physics and Geology

MATHEMATICAL PHYSICS

See under Physics and Mathematics

MATHEMATICAL STUDIES (*Consult Professor N.A. Derzko, Department of Mathematics*)

This programme provides a broad training in mathematics without the special emphasis on analysis that is necessary for many graduate programmes in mathematics. It is excellent preparation for prospective mathematics teachers.

First-year: MAT 139/(140 & 150); CSC (148F & 158S)

Second year: MAT 140/240F; MAT 239/250; STA 252; MAT 244F/APM 251

Third year: MAT 340/345; MAT 245S/325; one mathematics option

Fourth year: five options; students should consult the Undergraduate Secretary

MATHEMATICS (*Consult Professor N.A. Derzko, Department of Mathematics*)

This programme is designed to prepare a student for graduate work in mathematics, applied mathematics, probability or statistics.

First year: MAT 140, 150; PHY 150

Second year: APM 251; MAT 240F, 245S, 250; STA 252

Third year: MAT 330, 340, 350

Fourth year: five courses; students should consult the Undergraduate Secretary

NOTE: A student may after consultation with the Undergraduate Secretary defer any course to the subsequent year. It is recommended that students acquire a reading knowledge of at least one of German and Russian. Students wishing to follow a programme in statistics or probability should include MAT 454F in their options, as well as the courses offered in their field. Students wishing a programme in Analysis or Applied Mathematics should include MAT 435 in their options.

MATHEMATICS AND BIOLOGY (*Consult Professor J. Dainty, Department of Botany, and Professor J.E. Paloheimo, Department of Zoology*)

This programme is designed to meet the increasing demand for mathematically oriented biologists

First year: BIO 100/110/120/BOT 100; CHM 120; MAT 139/(140 & 150); PHY 110/111/130/150

Second year: CHM 240/241; MAT 239; PHY 230; STA 232/252; ZOO 223/BOT 230F/240

Third year: CSC 148F, MAT 244F & 319S; STA 332F & 342S; ZOO and/or BOT courses

Fourth year: Courses in Statistics to include multivariate analysis and stochastic processes; PHY 332F, 333S/ZOO 478F, 479S

MATHEMATICS AND CHEMISTRY (*Consult Departments of Chemistry and Mathematics (Professor P.G. Norton)*)

First year: CHM 120; CSC 148F; MAT 140, 150; PHY 150

Second year: APM 251; CHM 220/221, 230S and/or 240/241; MAT 240F, 250 (PHY 250 is recommended as an extra subject)

Third year: 1973-74: CHM 320/321, 230S or (240/241) (if not taken previously), 422F, 423S, MAT 340, 350

1974-75: CHM 320/321, 230S or (240/241) (if not taken previously), $\frac{1}{2}$ CHM course; MAT 340, 350

Fourth year: 1973-74, 1974-75: MAT 330, APM 351/421F; $1\frac{1}{2}$ courses from CHM 330, 340/341, 420, 424F, 425S, 428, 429Y

1975-76: MAT 330; APM 351/421F; CHM 422F, 423S; $\frac{1}{2}$ 300-400 series CHM course

MATHEMATICS AND ECONOMICS (*Consult Professor D.E. Campbell, Institute for Quantitative Analysis*)

This programme provides a firm mathematical foundation for subsequent work in Economics

First year: MAT 139/(140 & 150); ECO 100

Second year: MAT (140 & 239)/(240F & 250); MAT 244F/APM 251; STA 252; ECO (240F & 241S)

Third and fourth years: MAT 314F/350; APM (451F & 456S); ECO 332; at least four additional courses in Economics and/or Mathematics

MATHEMATICS AND LINGUISTICS (*Consult Professor B. Brainerd, Department of Mathematics*)

A programme for students interested in the application of mathematics to the study of the structure of language

First year: MAT 134/135/139/(140 & 150); CSC 148F; JAL 100

Second year: MAT (225/224F & 234)/(240F & 250); STA 232/252; LIN 230

Third year: LIN 326, (228F & 229S); STA (332F & 342S)/357/347S

Fourth year: LIN 491; MAT 409S; an additional course in mathematics

NOTE: During the four years, the student should also have taken LIN 201S/JAL 300 and also one of ANT 220, LIN 348 or a spoken non-European language

MATHEMATICS AND PHILOSOPHY (*Consult Professor F. Tall, Department of Mathematics and Professor B.C. van Fraassen, Department of Philosophy*)

This programme is designed to emphasize those aspects of each discipline which are of particular interest to the other both historically and currently.

First year: MAT (140 & 150); PHL 100

Second year: MAT 309S, 239/(240F & 250); PHL 251S

Third year: MAT 340/345/404F; and three of PHL 350S, 351F, 352F, 354S, 380S

Fourth year: CSC 438F; MAT 420; one of PHL 450F, 451S, 452F

MATHEMATICS FOR TEACHING (*Consult Professor W.W. Sawyer, Department of Mathematics*)

A programme to provide a deep understanding of elementary mathematics and a broad view of the subject and its applications. The programme should include at least nine full courses from the following: MAT 120, 220, 320, first-year calculus, second-year calculus; MAT 140/224F, 225, 325, 314F, 300/345, 420, 414F, 309S; APM 331F, 336S; STA 232; CSC 108F/Y/148F. The choice should include at least one-half computer science course, one full calculus course, and one and a half algebra courses.

NOTE: Courses in history, philosophy and psychology are suggested for inclusion in the whole programme. Any of the other suggested programmes in mathematics, or mathematics combined with another subject, is also an excellent preparation for teaching.

MICROBIOLOGY (*Consult Department of Microbiology—School of Hygiene*)

First year: BIO 100/110/120; CHM 120; MAT 130/135/150; PHY 110/111/130/150

Second year: CHM 240; STA 232; selection from MBL 200, BOT & ZOO courses

Third year: BCH 320/321, 370Y; MBL 320; JBM 350

Fourth year: selection from MBL 422, 424F, 425S, 430, 431F, 432S; PHY 332F, 333S; and from BCH, BOT & ZOO courses

PHYSICS (*Consult Department of Physics*)

First year: PHY 150; MAT 139/(140, 150)

Second year: APM 346S; MAT 239, 244F; PHY 226Y, 250, 251S, 252F

Third year: MAT 334F; PHY 325/326Y/327F/328S, 350, 351F, 352, 353S

Fourth year: At least three 400-series PHY courses

PHYSICS WITH ASTRONOMY

See under Astronomy and Astrophysics

PHYSICS WITH CHEMISTRY

See under Chemical Physics

PHYSICS AND GEOLOGY (*Consult Departments of Physics and Geology*)

First year: CHM 120; CSC 148F/148Y; GLG 120; MAT 139, PHY 130/150

Second year: GLG 220; MAT 239, 224F, 244F/APM 331F; PHY 230/(250, 251S), 252F

Third year: APM 346S (if MAT 244F taken in second year); GLG 320, 321F, 322, 327S;

MAT 319S; PHY 334F/330/350, 324Y

Fourth year: PHY 423S, 442, 443

PHYSICS AND MATHEMATICS (*Consult Department of Physics and Professor D. Masson or E. Prugovecki, Department of Mathematics*)

First year: MAT 140, 150; PHY 150

Second year: MAT 240F, 250; APM 251; PHY 226Y, 250, 252F, 253S

Third year: MAT 330, 350; APM 351; PHY 350, 351F, 352

Fourth year: APM 421F; PHY 326Y/327F/328S, 450; two of APM 426S (with MAT 465F as prerequisite), and any 400-series PHY courses

PHYSICS AND PHILOSOPHY

See under Philosophy and Physics under B.A. Programmes

PHYSIOLOGY (*Consult Department of Physiology—Faculty of Medicine*)

First year: CHM 120; BIO 100/110/120; MAT 130/135/139/150; PHY 150/130/110

Second year: ANA 200/ZOO (250 & 251); CHM 240/241; STA 232

Third year: PSL (322 & 373Y); BCH (320 & 370Y)/(321 & 371Y); ZOO 211

Fourth year: a selection of at least four courses from PSL 424, 427, 428, 430, 498; ZOO 441Y, 442Y, 440

PSYCHOLOGY (*Consult Department of Psychology*)

A booklet with further information may be obtained in Room 4044, Sidney Smith Hall. There is no prescribed programme for students specializing in Psychology and the Department does not certify specialization on transcripts. Students may enrol in any course offered by the Department for which they have fulfilled the prerequisites. However, students who wish to prepare for a career in Psychology are advised to build their programmes along the following lines:

First year: PSY 100/105

Second year: STA 222/232/252/PSY 230F and four or five half-courses selected from those offered at the two-hundred level. In particular, it should be noted that PSY 230F (or STA 222/232/252) is required preparation for most higher-level courses. Students seeking

PSYCHOLOGY (*Continued*)

admission to any of PSY 320, 321, 322, 323, 350, 351, 315F/329S must include STA 222/232/252 in their preparation. If this has been done PSY 230F should not be included in the programme. A student who has taken PSY 230F and who later decides to seek admission to one of the above-mentioned courses, must first take STA 222/232/252 or demonstrate that he has equivalent background.

Third year: PSY 320/321/322/323/350/351 (available only to students who have included STA 222/232/252 in the second-year programme) and/or one, two or three full course equivalents chosen from courses offered at the 200-300 levels.

Fourth year: two or three full course equivalents chosen from courses offered at the 300-400 levels. PSY 400 is recommended for students who desire research experience.

NOTE: Attention is drawn to the desirability of inclusion of courses in mathematics, life sciences and physical and social sciences in the programme.

PSYCHOLOGY AND PHYSIOLOGY (*Consult Professor J.A. Satterberg, Departments of Psychology and Physiology—Faculty of Medicine*)

The purpose of the combined programme in Psychology and Physiology is to provide the essential background for students preparing for a career in the neurosciences. This programme is especially appropriate for students planning to do graduate work in either Physiological Psychology, or Neurophysiology. The programme requires four full years of study and the student is well advised to plan the programme carefully early in his studies since many of the advanced courses in the fields are dependent upon sequences of pre-requisites. The first year should include: BIO 110; CHM 120; MAT 130/135; PSY 100; and, PHY 110/111. Courses in Chemistry, Statistics, and Anatomy would be included in the second year. The third year would include BCH 320/321, PSL 322 and PSL 373Y, and the final year PCL 470/PSL 424/PSL 427F/ZOO 441Y & 442Y, and PSL 498/PSY 400 (Thesis). In the second, third and fourth years additional courses in Psychology should be included. Of particular interest are PSY (223F & 243S), PSY (220F/S & 346S), PSY 250/ZOO 222, PSY 300S, 319F, 324F, 344F, and 345S. Some of these courses are offered in alternate years only. PSY 250/ZOO 222 is pre-requisite to these last-named 300-level courses. Attention is also drawn to PSY 320, 321, 322 and 350 (pre-requisites should in all cases be noted).

NOTE: Students should consult with Professor Satterberg *early* in their programme. If it is desired to have the transcript endorsed "Completed Specialist Programme in Psychology and Physiology", written approval of the programme should be obtained from Professor Satterberg at this time. In March of the fourth year application for the endorsement should be made to him.

ZOOLOGY (*Consult Department of Zoology*)

There is no prescribed programme for students specializing in Zoology, and no provision for certification. However, students who wish to prepare for a career in Zoology are advised to build their programme along the following lines:

First year: BIO 100/110/120; CHM 120; PHY 110/111/130/150, and a first-year Mathematics course other than MAT 120

Second year: CHM 240/241; STA 232/252, and at least two of ZOO 211, 212, 220, 221, 222, 224, 226, 250, 251, 253; JPZ 252. Students are advised to take one of the summer field courses (BIO 300F/301F) between second and third year

Third year: a selection from ZOO 223, 225 and any other 200-series courses. Students may take one or more 400-series course(s) in their third year

Fourth year: a selection from 200- and 400-series courses

NOTE: Certain interdisciplinary courses (INX listings) and courses in other sciences (Biochemistry, Botany, Geography, Geology, Microbiology, Parasitology, Physiology, Psychology, etc.) are appropriate to certain fields within Zoology and thus suggested for possible inclusion in the programme.

B.COM. PROGRAMME
(St. George Campus)

The Programme in Commerce and Finance begins formally in the second year and leads to the degree of Bachelor of Commerce on successful completion of the fourth year. In each year of the programme after first year the student will take six courses of which one is normally a free option that he may choose as he wishes. Students wishing to enter or proceed in this programme must enrol with the Department of Political Economy at the beginning of their second and subsequent years.

First year:

Students are advised to take at least some and preferably all of the three courses COM 100, ECO 102 and MAT 134/130. If these courses are not taken in the first year they must be taken in the second year. Students who enter the second year without them may be restricted in their choice of subjects in their second and subsequent years of the programme. Students expecting to enter this programme should feel free to pursue any special interests they may have in their selection of the remaining courses in their first year programme. Among those that are recommended for their consideration are COM 101, SOC 101, PSY 100, POL 100, ECO 101 and any modern language course. Since the later years of the programme include an "outside option" a student will find an advantage in selecting a course or courses in his first year in a subject that he may wish to pursue in subsequent years.

Second year:

COM (221F & 222S), or COM 100 if not taken in first year;
ECO 200, or ECO 102/100 if not taken in first year;
ACT 223F and 233S, or any other second year course (See Note 1);
ECO 220/STA 232 (See Notes 2 and 3);
One of COM 300, 301, MAT 134, MAT 234, ECO 101, 201, 202, 221, 236, 244, CSC (148F & 158S) (See Notes 4, 5, 6 and 7);
One course other than COM or ECO

- NOTES: (1) At the discretion of the instructor, ECO 220 may be accepted in lieu of STA 232 as a co-requisite for ACT 233S. In place of a second year course in this category a student may take COM 300 or 301.
- (2) A student who takes STA 232 instead of ECO 220 may offer it as one of his required courses in Economics.
- (3) Students planning graduate studies in the administrative or managerial sciences or in economic theory are advised to take MAT 234 and STA 232. A second course in MAT also offers some advantage for a student planning to take COM 425 (Managerial Economics) in his fourth year.
- (4) Second year enrolment in COM 300 is subject to space being available after third year students have been accommodated.
- (5) MAT 134/130 must be included in the second year programme if not taken in first year.
- (6) In deciding whether to take ECO 202 as well as ECO 200 in second year, students should be guided by the grade they received in first year in ECO 100/102 and by the probability of their wishing to take an ECO course in third year for which ECO 202 is a prerequisite. ECO 202 is a required course in the programme but may be taken in the third year instead.
- (7) A student taking CSC (148F & 158S) may count these two half-courses as the equivalent of a course in Economics for the purpose of completing the minimum of seven required courses in Economics.
- (8) To be reasonably assured of meeting the requirements for a B.Com. degree, a student should obtain marks of 60% or better in at least eight of the eleven courses he takes in first and second year.

Third year:

- The equivalent of *two* full courses from COM (221F & 222S), 300, 301, 303S, 320, 324F/S, 333F/335F, 334S/336S, 400, 401, 422. (See Notes 1 and 3);
 One of ECO 101, 200, 201, 221, 236 or any ECO course in the 300-series, MAT 234, STA 232 (See Notes 1 and 2);
 ECO 202 or, if already taken, any ECO course in the preceding group;
 One other third year course in COM or ECO;
 One course other than COM or ECO

- NOTES: (1) COM (221F & 222S), ECO 200, ECO 202 and ECO 220/STA 232 must be included in the third year programme if not taken in the second year;
 (2) At least one course in Economic History or the History of Economic Thought (ECO 101, 201, 221, 301, 322 and 342) should be completed by the end of third year;
 (3) Third year enrolments in COM 400, 401 and 422 are subject to space being available after fourth-year students have been accommodated.
 (4) For the purpose of planning his programme in subsequent years a student should bear in mind that, as a prerequisite for other courses, COM 220 became COM 221F and 222S commencing 1971-72.
 (5) To be reasonably assured of qualifying for a B.Com. degree, a student should have obtained marks of 60% or better in at least thirteen of the seventeen courses he will have taken by the end of his third year.
 (6) Students who wish to obtain a B.A. degree at the end of their third year instead of a B.Com. degree at the end of their fourth year are reminded that they must apply to their College Registrar early in their third year (prior to November 15).

Fourth year:

- COM 421;
 One of ECO (310F & 311S), (325F & 326S), 328, COM 425 (See Note 1);
 Three courses in COM and ECO selected from the 300- and 400-series (See Note 2);
 One course other than COM or ECO (See Note 2);

- NOTES: (1) A student who has taken one of these courses in his third year may take four instead of three courses in the next group.
 (2) When planning his fourth-year programme a student must keep in mind the requirements for standing and the required and the minimum number of courses in Commerce, Economics, etc. that must be included in the twenty-three courses comprising the complete Programme in Commerce and Finance.
 (3) A student who has obtained a B.A. degree at the end of his third year may not obtain a B.Com. degree at the end of his fourth year.

STUDY ELSEWHERE PROGRAMME

Chairman of Committee: Professor J.R. Webster (828-5276)

Possibilities for study away from Toronto

A student who wishes to include a period of study away from Toronto has these possibilities open to him:

(1) A student may enrol in the Study Elsewhere Programme which has developed in order to allow for as much freedom as possible in the choice of place and courses for a year of study away from Toronto, while still ensuring sufficient supervision by the University of Toronto so that full credit may be granted for the year's work. Among the advantages of the Programme (described below) are the fact that registration at the University of Toronto is unbroken, meaning that admission to the next higher year depends only on obtaining the required standing in the year's work according to the general rules of the Faculty, and that there is normal access to student aid. The major disadvantage lies in the obligation of preparing the "equivalent" of a Toronto programme at the host university. Although departments will allow a good deal of flexibility in the adaptation of actual offerings at the host university to the requirements of the equivalent Toronto programme, nevertheless full participation in the academic life of the host university may be limited by the fact that *supervision and evaluation of the year's work are most often done by the University of Toronto departments.*

(2) A student may *transfer* to another university, and subsequently apply for re-enrolment with "advanced standing" at the University of Toronto. This arrangement is advantageous in that the student is a genuine student of the host university, entering more completely into the academic life of the institution (it is often possible to remain at the university and complete a degree there instead of returning to Toronto). Among the disadvantages are the initial difficulties of gaining admission to the other university without losing credit for work already done at Toronto, and the subsequent difficulty of gaining re-enrolment to the University of Toronto for the following year—such re-enrolment is in direct competition with all other applicants for admission to higher years at Toronto (numerical limitations are imposed and high marks required). This is the normal recommendation for students wishing to study at English-language Canadian universities.

Eligibility for the Study Elsewhere Programme

Participation in the Programme is open to any student in the Faculty of Arts and Science who has achieved Second Year standing with an average of at least 70%. Although the Programme originally served the needs of students in modern languages and Fine Art, students in many other disciplines may also derive benefit in the context of their specialization, especially in programmes not fully available at the University of Toronto. While the ultimate control over participation in the Study Elsewhere Programme rests with the Committee on Study Elsewhere, the proposed Third Year programme must be approved by the department (s) concerned, and students must fulfil any additional requirements which may be set by the various departments. Some departments have developed special structures to govern their part of the programme, while others deal with applications and supervision on an ad hoc basis; and of course departments are free to decide against participating in the programme at all, if they feel that no significant academic benefits will be derived in their disciplines from work undertaken away from Toronto.

Third Year Programme

The student is expected to choose a programme of five Toronto courses or their equivalent for his Third Year, and to gain approval from the departments concerned for the preparation of this programme at another university. Since courses offered at the host university will rarely coincide precisely with Toronto courses, it is for the departments concerned to decide what will constitute the equivalent of a given number of their courses. Often it is possible simply to substitute material which is of a similar nature to that required by a named Toronto course; where this is not possible, many departments have "Independent study" courses, which may be adapted freely to match course offerings of a unique nature from the host university; or the department may agree to recommend the preparation of an independent programme which is equivalent (for example) to "three advanced level courses in Fine Art", etc.

Accreditation and Evaluation

Depending upon the nature of the programme which the department is able to approve, there are a number of possibilities open for the evaluation of the student's work.

(1) If the host university provides for year-end course evaluations, then a transcript of marks obtained may be brought back by the student, and on departmental recommendation these subjects will then be listed as "pass" courses.

(2) If no transcript is available, the Toronto department may arrange for supervision of course work during the year by correspondence, with evaluation of results through work submitted during the year and/or through examinations administered on the student's return to Toronto.

(3) If the work of the Third Year cannot be equated on a course-by-course basis with the Toronto curriculum, the department may choose to evaluate the work undertaken as a complete unit, and grant an appropriate "equivalent" credit, for example "B standing in 3 advanced level courses in Fine Art", etc.

Regulations for Residency and Withdrawal

Students are expected to spend at least the equivalent of a Toronto academic year while studying at the host university, and may be required to furnish proof of registration for the appropriate length of time at the institution(s) shown on the application form (e.g. by registration card or Student Book). If a student is forced to interrupt the Third Year programme and return to Toronto, he may submit a request for late registration up to October 5, and with departmental approval, enrol in regular courses at the University of Toronto, completing the Third Year in the normal fashion, paying the appropriate fees. After this date, a petition must be submitted through the College Registrar, stating the reasons for interruption of the programme and requesting permission to complete requirements for Third Year standing in some other manner. Up to February 15, a student may withdraw entirely from the Third Year Programme without academic penalty; after this date, a petition must be submitted through the College Registrar as above.

Recommended Procedures

During the Fall term of the Second Year, advice should be sought from the appropriate departments concerning the advisability of studying away from Toronto, and concerning the choice of a host university and programme of study. Application should be made early to the host university to ensure that registration is possible. Application must be made to the Committee on Study Elsewhere before February 15, on a form which is available through the College Registrar. Notice of provisional acceptance is issued by March 15, and final acceptance after the receipt of satisfactory Second-Year results (mid-June). In the meantime, all necessary travel arrangements should be made and course outlines, reading lists, etc. assembled. Before departure, the \$100 fee for Study Elsewhere is to be paid to the Comptroller and the receipt presented to the College Registrar, who will issue proof of Third Year registration at the University of Toronto. It is to be emphasized that it is the student's responsibility to undertake all negotiations with the host university, including application for admission, payment of all fees, application for student lodging, etc.

Specialized Programmes

Under the Jewish Studies programme, provision has been made for students who so choose to spend their Third Year at the Hebrew University of Jerusalem preparing a wide variety of courses which are co-ordinated by the department of Near Eastern Studies. Complete information is available from the chairman of this department. Under the Latin American Studies programme, co-ordinated studies may be undertaken at the University of Cali, Colombia. Further information is available from the Department of Italian and Hispanic Studies.

In each of the above cases, students are accepted under the general regulations for Study Elsewhere, subject to any further requirements which may be imposed by the officers of the programmes.

Counselling

The names and telephone numbers of the Departmental Advisers for Study Elsewhere precede the essay and course descriptions of the respective departments.

PREPARATION FOR STUDY IN PROFESSIONAL FACULTIES, SCHOOLS OR COLLEGES

Students who enter the Faculty of Arts and Science in order to qualify for later admission to a Professional Faculty or School such as Dentistry, Law, Library Science, Management Studies, Medicine, Social Work, are advised to consult the appropriate Faculty or School before devising their programme of study.

MEDICINE

Students may now satisfy the admission requirements of the Faculty of Medicine by completing a two-year programme in the Faculty of Arts and Science which includes BIO 100/110/120, CHM 120 & 240/241, MAT 130/134/135/150, PHY 110/111/130/150. Other courses should be chosen according to the student's interests.

TYPE A CERTIFICATION

The present requirements state that a candidate for an Interim Type A certificate must be one who:

- (a) has complied with admission requirements;
- (b) holds a degree of Bachelor of Arts or Bachelor of Science from an Ontario university, or an equivalent degree, in a programme
 - (i) that requires four years of university study, or their equivalent, beyond Grade 13, a total of at least sixty university credits, and
 - (ii) in which the candidate has obtained at least second class or equivalent standing in each of one or two specialist fields including, in the case of two specialist fields, at least forty-two university credits with not fewer than eighteen university credits in each of the specialist fields or, in the case of one specialist field, at least twenty-seven university credits; and
- (c) has successfully completed a programme of teacher education leading to an Interim High School Assistant's Certificate, Type A.

NOTE: The successful completion of a course or two half-courses in this Faculty earns three credits. The specialist fields referred to above, and listed in alphabetical order, are as follows: Agriculture, Anglais, Art, Biology, Chemistry, Computer Science, Drama or Theatre Arts, Economics, English, Français, French, Geography, Geology, German, Greek, History, Home Economics, Italian, Latin, Mathematics, Music, Physical and Health Education, Physics, Political Science, Psychology, Russian, Sociology, Spanish.

Specific questions with respect to Type A qualification should be addressed to the Office of Advanced Standing, Faculty of Education, University of Toronto, 371 Bloor Street West, Toronto 181 Ontario, M5S 2R7.

Departments of the Faculty and
Courses of Instruction

ACCOUNTING - See "Commerce" (COM)

ACT

ACTUARIAL SCIENCE

Given by the staff of the Department of Mathematics

See also APM, MAT, STA

Students should refer to the essay published under "Mathematics."

- ACT 223F **Mathematics of Investment and Credit** 2L,1T:MWF10
Interest, discount, and present values, as applied to determine prices and values of mortgages, bonds, shares of stock; loan repayment schedules and consumer finance payments in general; yield rates on investments given the costs of the investments and the cash returns; effective costs of credit arrangements.
Prerequisite: A first-year calculus course
- ACT 233S **Introductory Life Contingencies** 2L,1T:MWF10
Probability theory applied to problems involving life and death of one or more lives; costs of life assurances, life annuities, pensions; determination of balance sheet reserves; standard international notation.
Recommended preparation: ACT 223F
Co-requisite: STA 232/252
- ACT 323 **Finite Calculus** 2L,1T:MW1,R3
Interpolation, roots of equations, summation, integration, graduation, difference equations.
Prerequisite: Any second-year calculus course
- ACT 333 **Theory of Life Contingencies A** 2L,1T:TWR4
An advanced course covering: laws of mortality; population theory (stationary, varying); special annuity and insurance benefits and combinations thereof; fractional premiums; reserve liabilities in theory and practice; effects of changes in interest and mortality assumptions; expenses; gross premiums, asset shares, modified reserves, cash values; non-forfeiture options; distribution of surplus.
Recommended preparation: ACT 233S (not to be taken concurrently)
- ACT 423 **Theory of Life Contingencies B** 2L,1T:MWF12
Probabilities, present values, reserves, when two or more lives are involved; value of payments conditional on the lives dying in a certain order. Analysis of tables that show survivorship where there is more than one mode of exit from the cohort; applications to pension and disability plans.
Co-requisite: ACT 333
- ACT 433 **Selected Actuarial Topics** 2L,1T:MWF2
For example: preparation and analysis of raw data; applications of operations research; risk theory; financing of pensions; social insurance; demography.
Recommended preparation: ACT 333

ANA**ANATOMY**

Given by the Staff of the Faculty of Medicine

<i>Chairman of Department:</i>	Professor J.S. Thompson
<i>Adviser:</i>	Professor A.G. Erwin
<i>Enquiries:</i>	Medical Sciences Building, Room 1156 (928-2690)

Historically "Anatomy is the artificial separation of the parts of an organized body in order to discover their position, structure and economy". While this basic orientation has not altered, the sophistication of the techniques of investigation of "Structure and economy", has altered considerably. At present structure and function are investigated with tools ranging from the electron microscopes, chromatography, radio-isotope labelling, to the naked eye. Human structure, and its limitations, is studied from conception to death. A variety of disciplines benefit from the results of such investigations, for example, Medicine, Religious Studies, Physiology and Physics. A vigorous programme of broadly based research and teaching has evolved from this concept. Specific areas of "Gross Anatomy", "Neuroanatomy", "Histology", "Cytology", "Growth and Development" and "Embryology" are identified. Courses offered by the department provide an overview of the subject to the interested general biology student and also intensive investigation in specific areas for students in advanced stages of biology programmes and for students in professional degree programmes.

Note: All ANA courses have restricted enrolment.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- ANA 200 **Human Anatomy and Histology** 2L:TR3, 2P:W9-11
 A general survey course of all aspects of the structure of the human body and its relationship to function. Basic Human Cytology, Histology, Gross Anatomy, Neuroanatomy and relevant Embryology are covered. Practical work will consist of demonstrations. The orientation is toward the needs of Arts and Science students (as opposed to Medical students' needs). *A.G. Erwin.*
Suggested Prior Course: BIO 100/110/120
Prerequisite: Consent of Instructor

COURSES OPEN TO THIRD- AND FOURTH-YEAR STUDENTS

- ANA 498 **Project in Anatomy** N
 A research project in Histology, Embryology, Neuroanatomy or Gross Anatomy, requiring the consent of a professor to supervise the project. Recommended for third- and fourth-year students.

ANT**ANTHROPOLOGY**

<i>Chairman of Department:</i>	Professor T. McFeat (Acting Chairman until June 30, 1973)
<i>Undergraduate Secretary:</i>	
<i>Enquiries:</i>	Room 1037, Sidney Smith Hall (928-3294)

Anthropology, in the most general sense, is concerned with man's development throughout the world. Within the spectrum of the social sciences, Anthropology tends to focus on human societies that have not been or are just beginning to be influenced, directly or indirectly, by industrialism. This very broad interest has led to the division of the discipline into distinctive areas of research.

ARCHAEOLOGY

Archaeology is the study of surviving changes in the material world that are the result of the action of man. Archaeologists excavate sites, found by survey techniques, that contain remains of human activity. From the materials uncovered, classes of artifacts are established, based on analysis of form

and function. The spatial and temporal relations of artifacts from a number of sites are studied. From such studies archaeologists draw conclusions about the nature of social groups, adaptations to environment, and spatial and temporal relations of the groups involved. Two important features of archaeological work are the careful observation of stratigraphy uncovered in excavation and the increasing use of highly accurate dating techniques based on physical, chemical and biological characteristics of materials found. General topics include: the origins and dispersal of early tool traditions; adaptations to cold conditions in the Ice Age; the peopling of the New World; the development of agriculture and of civilizations in the Old and New Worlds.

LINGUISTIC ANTHROPOLOGY

Linguistics is the scientific study of language. In anthropological linguistics certain aspects of language study are emphasized. One important aspect is the relation of language to culture. Here language is studied as the primary means of communication in human life. In and through language members of a community interact, and the cultural facts of a society are manifested. It plays a critical role in the transmission of culture through time.

Another important aspect of Anthropological Linguistics is language classification. Typological classification deals with the grouping of languages according to their structural characteristics. Comparative-historical classification groups languages which have evolved from a common origin (such as French, Spanish, and Roumanian from earlier Latin). Dialectology deals with the variation of language over an area. Such studies are valuable for the light they shed on pre-history. As anthropologists are often interested in the lesser known peoples of the world, linguistic field methods have come to provide techniques for the analysis of languages which have not previously been studied.

PHYSICAL ANTHROPOLOGY

Physical Anthropology and human biology are concerned with the study of the biological evolution of man and the spectrum of human variability seen in living populations of mankind. To study the evolution of man, one studies the evolution of his primate relatives, as well as the fossil remains of earlier human populations. The study of living populations, or races of people, is accomplished through measurements of various kinds, e.g., of body proportions, of the colour of hair, eyes and skin, blood group frequencies, and the analysis of these data. Statistical techniques are used to assess the biological affinities of populations, and to help in tracing their migrations. Basic to the study of Physical Anthropology is an understanding of the laws of human genetics, and an understanding of man's ecological background. Some basic concepts of the subject are natural selection and human evolution to produce the polytypic species that is mankind today.

SOCIAL AND CULTURAL ANTHROPOLOGY

Social Anthropology is the study of the social life of man. Traditionally, social anthropologists have investigated small-scale societies, usually non-literate and isolated groups, because it was possible to observe them in their totality. More recently Social Anthropology has become interested in society in general. In the modern western industrial societies it studies ethnic minorities and other units such as factories, street-corner cliques, and political factions, where the depth and intensity of small group interaction is part of the social process. Institutions and models of social behaviour can be compared cross-culturally to establish more general concepts and trends. Topics include political, economic and ritual behaviour, as well as sanctions, including gossip.

Careers in Anthropology usually emphasize either theoretical, academic aspects, or practical applications of the discipline. Researchers in Anthropology are generally connected with a university or a museum. Most institutions involved in teaching and research require professional anthropologists who have obtained the Ph.D. degree. Examples of the practical applications of Anthropology range from work on problems concerning the contact of groups with varied social and cultural backgrounds, to preservation of archaeological material in connection with development and expansion of regional recreation facilities. For a career in such practical applications, training at least to the M.A. level is required.

As a science emphasizing comparative study of social and cultural variation throughout the world, and man's biological background, Anthropology offers a unique grounding for interests and studies in the Humanities, other Social Sciences, Psychology, Biological and Medical Sciences, and Geography.

Three courses are offered in the First Year and seven in the Second Year. There are no prerequisites for any of these, nor is there a defined programme for a student who seeks to specialize in Anthropology in the Second Year; however some second-year courses will be prerequisites to courses in the Third and Fourth years. For instance the Introduction to General Linguistics in the Second Year is a prerequisite for several of the advanced courses in Anthropological Linguistics. There are similar prerequisites in the other divisions of Anthropology.

In the First and Second Years, and later years as well, courses in Anthropology can be fruitfully combined with courses in a wide variety of other disciplines. A few examples should make this breadth clear. A student interested in Anthropological Linguistics would find language courses in many departments relevant. A student of Physical Anthropology could strengthen his area of interest with courses in Zoology and Anatomy. An interest in Social Anthropology could be complemented with a variety of courses in Sociology. Finally the archaeologist might find courses in Geology important if his main interest were early man. Because of the wide scope of Anthropology, courses cannot be narrowly prescribed. Students interested in concentrating their studies in this field must consult with members of the teaching staff to ensure that they are following a programme suited to their interests.

The Anthropology Student Union compiles an Anthropology Course Evaluation during the Spring Term. Copies of this are available in the departmental office, the departmental library, and the Anthropology Student Union office (Room 1047, Sidney Smith Hall). The ASU welcomes comments, criticisms, questions, and suggestions.

Where possible, the name of the instructor of a course has been shown in the course description below. An up-to-date list of instructors will be posted outside the Anthropology Office (Room 1037, Sidney Smith Hall) in September.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- ANT 100 **Introduction to Anthropology** 2L LI:TR12, L2:TR10
 An introduction to the Department and subject, stressing the unity and diversity of anthropology. In proceeding through the origins and development of homo sapiens and the living populations, the growth, diversity and structure of societies, cultures and languages, this course will cover all fields of anthropology. These are, in order of presentation, physical anthropology, archaeology, social and cultural anthropology and linguistics.
- JAL 100 **Introduction to General Linguistics**
 (See JAL under "Joint Courses")
- ANT 150 **Doing Anthropology** 2L:TR12, 1T:F1
 Emphasis is placed on the student participating in projects involving some aspect of Anthropology. The course begins with a lecture series considering Anthropology from a number of points of view. The class is then divided into small task groups. It is later recombined to allow for the presentation of the results of each group. *T. McFeat*
- ANT 222 **Introduction to the Study of Canadian Indian Languages**
 (This course is described in the section which follows.)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- ANT 201 **North American Prehistory** 2L:TR9, 1T:N
 An intensive survey course of North American history from the time of man's entry into the New World to the prehistoric period. Major prehistoric culture areas will be presented with representative archaeological sites being discussed in depth. Major theories and approaches will be demonstrated through the medium of such study. *J.N. Emerson*

- ANT 203 **Introduction to Physical Anthropology** 2L:TR2, 1P:N
An introduction to the problems related to the evolution of man; past, present and future, paying particular attention to behavioural and genetical aspects.
- ANT 204 **Social and Cultural Anthropology** 2L:TR11, 1T:N
The study of social organizations and structure including belief systems, kinship and marriage, politics and ecology.
- ANT 220 **Languages of the World** 3L:MWF3
A survey of the languages of the world, and of the groups and subgroups into which they are classified. A discussion of linguistic structures and of the methods of language classification. This course covers the domains of linguistic geography and language typology, and provides a background in linguistics for students of anthropology.
- ANT 222 **Introduction to the Study of Canadian Indian Languages** 2L:TR10, 1T:N
A general introduction to the study of Canadian Indian languages, their classification and their structures. The course will include detailed descriptions of several languages.
- ANT 241 **North American Indian in Transition** 2L:TR2, 1T:N
A discussion of the established culture areas and types existing in precontact and early contact times in North America followed by an analysis of the problems arising out of contacts between North American Indians and Euroamericans.
- ANT 250 **History of Anthropological Thought** 2L:R4-6, 1T:N
This course will examine the process by which anthropology became identified as a field of study and the process by which various sub-fields developed. The roles of individual scholars in conjunction with trends of thought will be examined.
Prerequisite: Departmental approval

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- JAL 300 **Sociolinguistics**
(See JAL under "Joint Courses")
- JAL 301 **Language and Social Issues** (Not offered 1973-74)
(See JAL under "Joint Courses")
- JAL 303F **Sociolinguistic Methods** (Not offered 1973-74)
(see JAL under "Joint Courses")
- JPA 300 **Physics and Archaeology**
(See JPA under "Joint Courses")
- ANT 310F **Palaeolithic Archaeology** (Not offered 1973-74)
An introduction to the study of cultural development during the Pleistocene. Lectures and occasional laboratories.
- ANT 311F **Archaeological Fieldwork** 3P:W2-5
Takes place essentially *in the field*, and seeks to evaluate the student's status as an efficient, thoughtful, and possibly qualified archaeological field worker. *J.N. Emerson*
- ANT 312F **Archaeological Analysis** (Not offered 1973-74)
This course seeks to expose the student to the process whereby archaeological data become meaningful. Ideally the student will research and analyse material which he or she has helped excavate in the field course (see 311F).

- ANT 314F **Neolithic Archaeology** (Not offered 1973-74) 2L
- ANT 331F **Problems in Human Evolution** 3P:N
Prerequisite: Departmental approval. *A.B. Chiarelli*
- JAH 324 **Peasants and Feudal Institutions**
 (See JAH under "Joint Courses")
- ANT 336F **Anthropological Genetics** 3P:R9-12
 Causes of human evolution. Genes in population: (1) An enumeration of the factors contributing to gene frequency and the development of the model of natural selection. (2) Gene frequency change: mutation, migration and random gene drift. Simple quantitative models of their effect in changing gene frequencies. Dynamics of polymorphism: inheritance of specific systems—blood groups, serum proteins, hemoglobin and enzymes. Population structure, inbreeding and outbreeding. Heredity and environment. Eugenics, euphenics and human welfare. Human population cytogenetics.
Exclusion: ZOO 211
Prerequisite: ANT 203 or departmental approval
- ANT 338S **Human Biology and Evolution** 2L:TR10
 The first half of the course is devoted to evolutionary processes; these are primarily genetic processes. The second part of the course is on human biology in relation to culture and ecology.
- ANT 339F **Biological History of Human Population** 2L:TR10
 The distribution of human populations from the 14th century until recent times, the effect of changes in climates and environment in prehistoric and early historic times will be discussed.
 The available archaeological and paleontological data on the origin and movements of the populations in the different continents will be synthesized. *A.B. Chiarelli*
Prerequisite: ANT 203 or departmental approval
- ANT 340 **Political Anthropology** 2S:TR3
Prerequisite: ANT 204 or departmental approval
- ANT 341 **Anthropology of Religion** 2L:TR2
Prerequisite: ANT 204 or departmental approval
- ANT 342 **Culture and Communication** (Not offered 1973-74)
 This seminar has been designed to explore culture as communication and communication as a non-linguistic process of information exchange. Concepts of media, channel, code, interaction, perception and situation are the lenses through which information may be observed to enter group behaviour. Of special interest are primary message systems involved in territoriality, ritual events, games, group interactions, myths and mass media. The approach is comparative, therefore the field of animal behaviour, while not central will be presented.
- JAP 343 **Introduction to African Politics and Society**
 (See JAP under "Joint Courses")
- ANT 344 **Peoples and Cultures of Southeast Asia** 2S:TR12
Prerequisite: ANT 220 or departmental approval

- ANT 345 **Peoples and Cultures of West Africa** 2L:R4-6
Politics, economics, religion, marriage and kinship in traditional, colonial, and contemporary West African societies. Emphasis will be on the anthropological literature, but other social science writings will also be used.
- ANT 346 **Social Evolution** 2L:MW1
An examination of the major features of social evolution from bands and tribes to modern industrial states. Special topics will include the evolution of labour organization, population growth, warfare and childrearing practices. *R. Lee*
- ANT 347 **Comparative Study of Group Cultures** 2L:T4-6
The first unit of analysis in this study will be groups, namely, small-groups including task-forces such as work groups, crews, teams and committees; therapeutic and connecting groups such as households and networks will also be the subjects of interest. Primary groups other than small-groups include councils of various descriptions whose integrative and disruptive activities in communities we shall examine.
We will approach the variety of such group cultures principally by comparing the best ethnographic case histories available in the literature of anthropology. *T. McFeat*
- ANT 354 **Yiddish** 3S S1:MWF1, S2:MWF3
Introduction to Yiddish language, literature, and culture, featuring intensive practice with a native speaker. The dialect taught will be that of the text: Uriel Weinreich, *College Yiddish*. The course will be restricted to eight students unless otherwise announced.
- ANT 446 **Selected Topics in Canadian Society and Culture**
(This course is described in the section which follows.)

COURSES OPEN TO FOURTH-YEAR STUDENTS

- ANT 411S **Archaeological Theory** 2S:T2-4
A review of the literature on taxonomy, cultural evolution, and basic concepts used to describe prehistoric events and processes. *W.N. Irving*
Prerequisite: one full course in Archaeology
- ANT 412 **Arctic Archaeology** (Not offered 1973-74)
The prehistoric and early historic background of northern Indians and Eskimos, from about 6000 B.C. to 1900 A.D. Emphasis varies according to interest.
Prerequisite: Permission of the instructor
- ANT 414F **Advanced Regional Archaeology: Middle America** 2L:M12-2, 1T:F12
A survey of the development of Mesoamerica as a distinctive culture area and civilization. Emphasis will be placed on the archaeological evidence in the context of anthropological thought.
- ANT 415S **Archaeology of Eastern North America** 1L,2T:N
Prerequisite: One archaeology course
- ANT 416F **Archaeological Interpretation** 2L,1T 2L:TR2, 1T:N
A study of techniques used to transform statements about artifacts and their context of discovery into statements about people and their life ways.
Prerequisite: ANT 311F/312F
- ANT 417F **Early Man in North America I** 2L:TR12
The archaeology of the earliest populations in the New World. Intended to prepare students for participation in ANT 418S. *W.N. Irving*
Prerequisite: One course in anthropology

- ANT 418S **Early Man in North America II** 2L:TR2
 Research on specific aspects of the prehistory and palaeoecology of early man in the New World. *W.N. Irving*
Prerequisite: ANT 417F or departmental approval
- ANT 419S **Problems in Old World Archaeology: Palaeolithic** 2P:TR12
 The examination in detail of a series of selected problems concerning the origin and evolution of culture during the Pleistocene.
Prerequisite: ANT 310F or departmental approval
- ANT 420 **Language and Culture** (Not offered 1973-74)
 An examination of language as shaper, mediator and interpreter of culture, with emphasis upon the interrelationships between linguistic systems and other cultural systems.
Prerequisite: ANT 220/JAL 100
- ANT 421 **Problems in Phonology** N
 This course allows a student to investigate the phonological systems of specific languages or language families in which he has a special research interest.
Prerequisite: Departmental approval
- JAZ 421F **Human Genetics**
 (See JAZ under "Joint Courses")
- ANT 422 **Advanced Topics in Linguistics** N
 This course allows a student to pursue linguistic research in a specific language or language family.
Prerequisite: Departmental approval
- ANT 423 **Language Typology** N
 About a dozen languages will be examined. These languages will be selected in such a way as to present a great variety of linguistic structures. The purpose of the course is to acquaint the student with the dimensions of linguistic diversity.
Prerequisite: JAL 100
- ANT 430 **Special Problems in Physical Anthropology** N
 Original research in physical anthropology under the personal supervision of an instructor.
Prerequisite: Departmental approval
- ANT 431 **Human Growth and Development** 2L:T4-6
Prerequisite: Permission of the instructor
- ANT 440 **Social Change** 2L:TR10
Prerequisite: ANT 204 or departmental approval
- ANT 441 **Ecology and Economic Anthropology** 2L:R9-11, 1T:N
 A review of the concepts, theories and controversies in cultural ecology and economic anthropology.
Prerequisite: ANT 204 or departmental approval
- ANT 443 **People and Cultures of Latin America and the Caribbean** 2L:M3-5
Prerequisite: ANT 204 or departmental approval
- ANT 444 **Fieldwork Seminar and Practice** N
 For intending Social Anthropologists who will be expected to design and complete a field research project in the course of the year.

- ANT 445 **Canadian Indian and Inuit Change** 2S:M9-11
 This is a seminar course. The focus of this course is briefly upon historical factors peculiar to the Canadian scene, followed by an intensive investigation of contemporary studies of change both in Indian and Inuit communities. This involves the socio-economic situation, governmental attempts at policy, the national and regional Indian organizations, and the social science literature.
Prerequisite: ANT 241 or permission of the instructor
- ANT 446 **Selected Topics in Canadian Society and Culture** 2L:T4-6
 A seminar on social and cultural aspects of Canadian society, including cultural ecology, kinship, ritual, sociolinguistics, and worldview. A review of the relevant literature and independent work leading to a research paper.
Prerequisite: ANT 150; ANT 204 or permission of the instructor
- ANT 450 **Departmental Seminar** 2S:R4-6
 The seminar is intended to provide an opportunity to pursue research on topics that amplify material presented in other courses in the department or on topics that are not available in other courses. *R.B. Drewitt*
- ANT 452F **Ethnohistory** 2S:T7:30-9:30p.m.
 An interdisciplinary approach to ethnohistory, emphasizing (1) critical evaluation of primary historical sources (writings and maps) for cultural and linguistic data, and (2) comparison and analysis of modern cultural sources, including history, genealogy, mythology, and geography (written and tape-recorded texts, vocabularies, etc.). Complementary archaeological data will be integrated where possible into this ethnographic and philological reconstruction of the prehistory and history of societies without a written historical tradition.
- ANT 472S **Problems in Ethnohistory: Eastern North America** 2S:T7:30-9:30p.m.
 This seminar, open to qualified undergraduates, will investigate selected problems in the ethnohistory of the indigenous peoples of Eastern North America, especially the Iroquoian, Algonquian, and Eskimo-Aleut families. Special attention will be paid to the linguistic developments and relationships. A good reading knowledge of a relevant language (e.g., French, Latin, or Mohawk) is desirable but not required.
Prerequisite: ANT 452F

APM**APPLIED MATHEMATICS**

Given by the staff of the Department of Mathematics

See also ACT, MAT, STA

Students should refer to the essay published under "Mathematics."

- APM 251 **Differential Equations in Applied Mathematics** 2L,1T:MWF9
 Ordinary differential equations, existence and uniqueness of solutions, linear systems, non-linear problems, boundary value problems and orthogonal functions, with applications to mechanics, dynamical systems, optimization, life sciences and economics.
Exclusion: APM 331F/APM 346S/MAT 244F
Prerequisite: MAT 140 and 150
Co-requisite: MAT 239/250
- APM 331F **Applied Differential Equations** 2L,1T:MWF2
 A study of ordinary and partial differential equations in a physical context.
Exclusion: MAT 244F/APM 251/346S
Prerequisite: MAT 230/234/235/239/250

- APM 336S **Mathematical Models in the Social Sciences** 2L,1T:MWF12
 Illustrative mathematical models in the behavioural sciences, psychology, sociology, economics and political science. Some acquaintance with calculus, differential equations, matrix algebra and probability theory is advisable.
Reference: Kemeny & Snell, *Mathematical Models in the Social Sciences*.
Prerequisite: Any two MAT courses
- APM 346S **Differential Equations** 2L,1T:MWF2
 Sturm-Liouville problems, Green's functions, special functions (Bessel, Legendre), partial differential equations of second order, separation of variables, integral equations.
Exclusion: APM 251/APM331F
Prerequisite: MAT 244F
Co-requisite: MAT 239/250
- APM 351 **Differential Equations of Mathematical Physics** 2L,1T:MWF9
 Distributions, elliptic, parabolic and hyperbolic partial differential equations in their physical contexts, transforms and conformal mapping, Green's functions, self-adjoint operators and eigenfunction expansions, variational methods.
Prerequisite: APM 251
Co-requisite: MAT 330/334F
- APM 421F **Foundations of Quantum Mechanics** 2L,1T:MWF12
 The general formulation of non-relativistic quantum mechanics based on the theory of linear operators in a Hilbert space. Applications to wave mechanics, scattering theory and symmetry theory.
Prerequisite: MAT 350
- APM 426S **General Relativity** 2L,1T:MWF12
 Space-time as a differentiable manifold, Minkowski space, equations of general relativity, special solutions, Cauchy problem, equations of motion.
Prerequisite: MAT 465F
- APM 436S **Fluid Mechanics** 2L:TR2, 1T:F4
 A study of flows in a Newtonian fluid, Stokes flows, boundary layers, shock waves, singular perturbations.
Co-requisite: APM 351
- APM 446S **Applied Functional Analysis** 3L:MWF1
 Hilbert and Banach spaces with applications, dual spaces, linear operators, elements of spectral theory, extremal problems, integral and functional equations, non-linear operators, stochastic differential equations.
Exclusion: MAT 350
Prerequisite: MAT 239/250
- APM 451F **Linear Programming and the Theory of Games** 2L:MW1, 1T:R4
 An advanced treatment of the theory, solution, and application of linear programming, game theory, network flow theory, the assignment problem, linear economic models and related topics in linear mathematics.
Exclusion: IND 420S
Prerequisite: MAT 314F/340/345/350
- APM 456S **Optimization and Control Theory** 2L:MW1, 1T:R4
 Theory of extrema for constrained problems; topics in non-linear programming, the calculus of variations, optimal control theory and applications.
Prerequisite: APM 251/346S/451F/MAT 350

APM 471F/476S/496 **Advanced Topics**

2L, 1T:N

Graduate level course in Applied Mathematics.

Co-requisite: Three other 400 level courses in mathematics; consent of the Instructor and the Undergraduate Secretary of the Department is required.**APPLIED SCIENCE AND ENGINEERING**

See "Chemical Engineering" (CHE); "Civil Engineering" (CIV); "Electrical Engineering" (ELE); "Industrial Engineering" (IND); and Metallurgy and Materials Science (MMS)

ARABIC - See "Islamic Studies" (ISL)

ARAMAIC - See "Near Eastern Studies" (NES)

AST**ASTRONOMY***Chairman of Department:*

Professor D.A. MacRae

Undergraduate Secretary:

Professor E.R. Seaquist

*Enquiries:*McLennan Physical Laboratories,
Room 1403 (928-3149)

In all of time on all the planets
 Of all the galaxies in space,
 What civilizations have arisen,
 Looked into the night,
 Seen what we see,
 Asked the questions that we ask?

"Universe" (National Film Board)

The subject has sometimes been regarded as nugatory but the modern view is quite the contrary. In all ages Astronomy has been in the background of man's thought. Its ideas pervade our literature. Trade and commerce have depended on it. And now in our own day Astronomy has become, unexpectedly, a matter of everyday concern. Its breadth in space and time and its concern both with the very large and the very small make a course in Astronomy an attractive component of any programme.

Several courses are offered to suit persons of diverse background and depth of interest. Two of the beginning courses do not require special knowledge of mathematics or the sciences. We are not concerned with formulae and detailed calculations, but rather with what the student can see with his unaided eye or with a telescope. Astronomical phenomena can be related to occurrences on earth and explained by familiar laws of physics. Extreme conditions, though unusual, need not be mysterious.

AST 100 is presented in such a way that students can learn about the universe we dwell in even though they do not have a scientific bent. It can profitably be taken in either First or Second Year since no other courses are prerequisites. The course is largely descriptive and covers the full range of astronomical topics. AST 200F is a half-course also designed for those students whose principal interests are non-scientific. It caters to the needs of students in the second or higher years whose programme in other areas requires them to limit themselves to a half-course. Given in the first term only, the lectures attempt to present up-to-date topics and to answer often-asked questions.

For the First Year student who is more interested in the sciences, AST 120 provides a survey of astronomy and astrophysics at the Grade XIII level of physics and mathematics. A science-oriented student will find here an opportunity to widen his exploration of science. He may have in view the possibility of pursuing the astronomy or astrophysics specialist programme in second year. Similarly, AST 220, offered in Second Year, is also designed especially for someone who is attracted to science, but one who has taken, or is presently taking, one of the first-year Physics courses. Either AST 120 or AST 220 will enable the student to gain a deeper insight into the physical nature of astronomical bodies and a

greater appreciation of the unusual conditions which are revealed when we study them. The tools and methods used by the astronomer are also better understood. His knowledge of Astronomy will be useful in later studies of Physics, the Geosciences and even Life Sciences.

In all four courses it is an objective to provide for personal involvement by the student. Primarily this is done by the use of telescopes on the roof-top observatory of the McLennan Physical Laboratories by day as well as by night. A visit to the David Dunlap Observatory is also arranged. The McLaughlin Planetarium is one of the best ways in which concepts can be presented in a realistic fashion. Motion pictures, slides and demonstrations are used extensively.

Public interest in Astronomy is increasing and for those who are planning a career in teaching it is becoming more necessary to be familiar with this area of science. The universe has always excited the imagination of students in elementary schools. Now, Astronomy is receiving more emphasis at the secondary school level than it did only a few years ago. In fact, a number of courses in Astronomy are accepted by The Faculty of Education as giving credit for Physics towards the entrance requirements for a teaching certificate programme at the Faculty. Students should consult The Faculty of Education for details.

For those students who feel that they might follow a career in Astronomy and Astrophysics or a related discipline, a programme in Astronomy and Astrophysics has been prepared in consultation with the Department of Physics (see under "B.Sc. Programmes"). The programme is identical to the physics programme in the Second Year, and is followed in the Third and Fourth years by four courses in Astronomy (of which two are half-courses) and certain courses in Physics and Mathematics. There is room for optional courses in related disciplines such as Chemistry or Geology. The aim of the programme is to provide for the student a proper balance between Astronomy and the other physical sciences which play important roles in astronomical research.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

AST 100 A Survey of Modern Astronomy

2L, $\frac{1}{2}$ P L1:MW10, L2:MW11, L3:MW12, L4:R7-10p.m.P:N

A general survey of modern astronomy giving a descriptive treatment of the nature of solar and stellar systems and the present conception of the structure of the universe. This course is intended for students with no science background or those who do not intend to specialize in science. It is not open to students who are currently enrolled in or have completed a 200 or higher series course in physics or chemistry. Sections L1 and L2 are reserved for students not enrolled in PHY 110, 111, 130 or 150. Enrolment restricted.

Exclusion: AST 120/220/200F

AST 120 Basic Astronomy and Astrophysics

2L, $\frac{1}{2}$ P L1:MW12, L2:MW1 P1:N

A general survey of astronomy in which concepts in basic physics are applied to a treatment of the solar system, stars and stellar systems, and the structure of the universe. This first-year course is intended for students who already have some background in science or those who are currently enrolled or in the future will be enrolling in science or engineering courses.

Exclusion: AST 100/200F/220

Prerequisite: XIII MAT, Functions and Relations, XIII PHY

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

AST 200F Astronomy

2L:MW1

A topical course in astronomy designed for specialists in disciplines other than the sciences. The emphasis will be on fields of current interest in astronomy with the aim of interpreting recent and forthcoming developments. This course is not available to students who are enrolled in or have completed a 200 or higher series course in physics or chemistry. Enrolment restricted.

Exclusion: AST 100/120/220

- AST 220 Introduction to Modern Astrophysics** 2L:MF1, 1P:W1
 A survey course in astrophysics intended for specialists in the physical sciences. Emphasis is placed on current developments and on the application of basic physics to astronomical problems. Although the course is complete in itself as a survey of astronomy, it is also a good preparation for AST 300 and/or AST 400. Under special circumstances, first-year students may be admitted to this course after consultation with the department,
Exclusion: AST 100/120/200F
Prerequisite or co-requisite: PHY 110/130/150

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- AST 300 Astronomy and Astrophysics** 2L:MW1
 A course in which a variety of fields of current astronomical interest are discussed. Topics include the spherical astronomy, planetary physics, the Galaxy, and extragalactic systems.
Recommended Preparation: MAT 230/234/235/239/250 and PHY 220/230
- AST 310Y Practical Astronomy** 2P:M9-11
 A half course consisting of one or more projects involving experimental work with telescopes and other astronomical equipment.
Co-requisite: AST 300

COURSES OPEN TO FOURTH-YEAR STUDENTS

- AST 400 Astrophysics** 2L:MF12
 The application of physics to the study of stellar atmospheres, stellar interiors, and interstellar matter.
Recommended Preparation: AST 300/220
- AST 410Y Research Topic in Astronomy** Arranged
 A half course consisting of a research report by the student in consultation with an individual staff member in the department. Students must enrol with the undergraduate secretary of the department.
Co-requisite: AST 400

BCH

BIOCHEMISTRY

Given by the Staff of the Faculty of Medicine

<i>Chairman of Department:</i>	Professor G.R. Williams
<i>Undergraduate Secretary:</i>	Professor D.O. Tinker
<i>Enquiries:</i>	Medical Sciences Building, Room 5207 (928-2700)

Biochemistry is concerned with the study of the living organism at the molecular level. The contributions of biochemistry to other biological and medical sciences in recent years have been most significant, and students undertaking studies in cell biology, genetics, pharmacology, physiology and many other disciplines find that a background in biochemistry is essential in their training. Specialization in Biochemistry may be profitably combined with training in chemistry (see under the Chemistry and Biochemistry programme) or with courses in the biological and medical sciences; students wishing to specialize in Biochemistry would be well-advised to consult with the Department for help in planning courses in earlier years.

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- BCH 320 Introductory Biochemistry** 2L:MW12
A lecture course in General Biochemistry, consisting of introduction to Macromolecular Biochemistry, and Metabolic Biochemistry.
Prerequisite: CHM 240/241, BIO 100/110/120 recommended
- BCH 321 Introductory Biochemistry** 2L, 1T:MWF12
A lecture course in General Biochemistry, consisting of introduction to Macromolecular Biochemistry, and Metabolic Biochemistry.
Prerequisite: BIO 100/110/120, CHM 220/221, 240/241
Co-requisite: CHM 220/221, 340/341, CHM 230S recommended
- BCH 370Y A Laboratory Course in Biochemical Techniques** 3P P1:M9-12,P2:F9-12,P3:T2-5
Terminal course for non-specialists.
Prerequisite: CHM 240/241
Co-requisite: BCH 320
- BCH 371Y A Laboratory Course in Biochemistry** 3P:W9-12
To complement BCH 321 and prepare for BCH 471
Prerequisite: CHM 240/241
Co-requisite: BCH 321

COURSES OPEN TO FOURTH-YEAR STUDENTS

Note: Each of BCH 421-426 will be offered for 2 years in a 3-year cycle.

- BCH 421F Structure and Function of Proteins** 2L:TR9
Prerequisite: BCH 320/321
- BCH 422F Biochemistry of Membranes** 2L:TR10
Prerequisite: BCH 320/321
- BCH 423S Metabolic Enzymology and Control Mechanisms** 2L:TR10
Prerequisite: BCH 320/321
- BCH 424S Bio-organic Mechanisms** 2L:TR9
An examination of the application of mechanistic chemistry to enzyme systems. The topics discussed include: catalysis, chemical model systems, coenzymes, metals, covalent catalysis.
Exclusion: CHM 447S
Prerequisite: BCH 320/321
- BCH 425F Nucleic Acids and Protein Synthesis** (Not offered 1973-74) 2L
Prerequisite: BCH 320/321
- BCH 426F Physical Biochemistry** (Not offered 1973-74) 2L
Prerequisite: CHM 220/221 and BCH 320/321
- BCH 471 Advanced Biochemistry Laboratory** 7P:Arranged
Prerequisite: BCH 371

BCH 473Y Special Work in Biochemistry

7P:Arranged

A research programme in a particular area of Biochemistry. A limited number of students may be enrolled by arrangement with the department and the instructor concerned. Normally offered only to those in the fourth year of the "Biochemistry" or "Chemistry and Biochemistry" programmes.

Prerequisite: BCH 321, BCH 371

Co-requisite: BCH 471

BIO**BIOLOGY**

Given by the Staff of the Departments of Botany and Zoology

Students are advised to consult essays and courses listed by the Departments of Botany and Zoology.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS**BIO 110 The Nature of Living Organisms**

2L ML1:TR9, UL2:TR11, ITL3:TR2, VL4:MW10, NL5:MW1
1T:N 2P:Arranged

This course deals with the general principles of biology, the range of this discipline, and its relevance to mankind. Living systems are examined at many levels, from the molecular to the ecological. There are opportunities to explore some topics in depth as well as to gain a basic knowledge of the concepts and skills of modern biology. Students are expected to attend an "open" laboratory weekly at hours of their choice. *N.G. Dengler, J.J.B. Smith and members of the Departments of Botany and Zoology.*

Exclusion: BIO 100,120

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS**Field courses in Biology**

The following courses are designed to provide field experience for students specializing in Botany and/or Zoology, including those students who intend to become biology teachers. For the latter group BIO 300F is especially relevant. These courses are given in the two-week period before the beginning of the fall term and normally would be taken by students entering their Third or Fourth Years. Each course may be considered as part of a student's five-course programme. The cost of each course, including board and lodging, will be \$75. Enrolment is limited. Further information may be obtained from the Departments of Botany and Zoology.

BIO 300F Terrestrial and Freshwater Biology

N

This course will be offered at the Ontario Forest Technical School near Dorset, Ontario. Emphasis will be on principles and methods in plant and animal ecology, and gaining familiarity with local flora and fauna. Terrestrial and freshwater ecosystems will be studied. Opportunity will be provided for students to undertake projects of their own.

Prerequisite: BIO 100/110/120

BIO 301F Marine Biology

N

A field course in Marine Biology, at St. Andrews, New Brunswick, consisting of informal lectures and seminars with intensive field and laboratory work. Different marine habitats are examined in detail and the animals and plants associated with them are classified. Students carry out projects in which they are encouraged to develop their own ideas and interests. Lectures on special topics are given by the scientific staff of the Biological Station.

Prerequisite: BIO 100/110/120

BOT**BOTANY**

<i>Chairman of Department:</i>	Professor J. Dainty
<i>Undergraduate Secretary:</i>	Professor P. Sarkar
<i>Student Counselling Service:</i>	928-3542
<i>Enquiries:</i>	Botany Building, Room 225 (928-3537)

Botany is the branch of biological sciences that concentrates on the study of plants. It is one of the most fundamental of subjects, since all animals, including man, depend for their very existence on the process of photosynthesis, which is unique in green plants.

Man has been a botanist since he first inhabited the earth, gathering the plants where he found them, but civilization could start only with the beginning of agriculture. Knowledge of plants is of the utmost importance in efforts to solve the urgent problems we are confronted with in our modern world, such as food shortage and pollution. Man's food and shelter, the oxygen he breathes, the condition of his environment and the fate of his civilization depend on maintaining a proper balance in the plant cover of this earth. Botany plays its role in studying the reaction of plant life to toxic and radioactive substances in the deteriorating environment. New high-yielding varieties of crops like corn and rice, recently developed, are greatly improving the food situation. Many therapeutic drugs, including antibiotics and tranquilizers, are gifts from the plants. Dramatic changes in our way of life have been brought about by the practical application of fundamental botanical research.

Originally Botany was a descriptive science, but it gradually developed to become the experimental science it is today. As such it has helped to open new horizons of progress in such borderline fields as biochemistry and biophysics. In many research problems plants are more suitable as objects of study than animals, and as a result botanists are in the front line of fundamental biological research. This starts at the molecular level, and deals with the structure, function, organization and development of cells and whole plants, as well as biological communities. The study of Botany encompasses plant life in all its forms, from viruses to higher plants, including such aspects as heredity, diseases and relation to the environment.

Careers for botanists are mainly in teaching and research. These aspects may be combined in universities, or pursued separately, the one in schools, the other in government institutions or museums, in connection with various botanical fields such as Agriculture, Horticulture, Forestry, Conservation, Plant Breeding, and others. Professional careers in Botany nowadays require a certain amount of specialization at the undergraduate level, while only the possession of an advanced degree will open prospects for promotion.

Those who want to teach Biology in the secondary schools should select a programme in Biology, balancing Botany and Zoology according to the requirements of The Faculty of Education for entrance to its various teaching-certificate programmes (including Type A). More general programmes can be devised, including Botany, either to obtain an overall knowledge of several fields, or to provide a background for environmental studies. A few examples of how a flexible programme can be applied, follow. Combinations with Chemistry can lead to specialization in Biochemistry, Microbiology, Food Chemistry or Chemotaxonomy. Combinations with Physics open the study of Biophysical problems, such as ion or water transport in plants, photosynthesis, many others. With Geology it may be applied to the use of plants as indicators of elements in the earth crust or of fossil plants to identify geological strata.

The main areas of specialization in Botany are: plant relationships (Systematic Botany, Biosystematics, Cytotaxonomy) and distribution (Phytogeography), structure and evolution (Anatomy and Morphology), function and development (Physiology), ultrastructure in relation to function (Cell Biology) or to hereditary problems (Cytology, Cytogenetics), plant diseases (Pathology, Virology), the interrelationships of plants and the environment (Ecology), the study of fungi (Mycology) or of algae (Phycology).

A student who wants to specialize in Botany should lay a foundation of knowledge of the Biological and Physical Sciences. A training in Mathematics is essential for the solution of a number of biological problems. Suggested programmes of study in Botany, in Biology and in Mathematics and Biology are given under the heading "B.Sc. Programmes."

Because of the great variety of possible combinations in Biology, prerequisites are kept to a

minimum, but students are strongly advised to follow the recommendations made by the Department. The Department should also be consulted if the students wish to follow a programme toward any particular area of specialization.

Admission to graduate studies in a botanical field will be based on the successful completion of a specialist programme in Botany. The backgrounds of other applicants for graduate work will be evaluated on an individual basis.

The students are advised to contact the Student Counselling Service for information regarding counsellors, instructor in course, time-table, location of classes, etc. A departmental brochure with detailed description of courses is available for distribution to the students in Room 303 of the Botany Building.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- BOT 100 Introduction to Plant Biology** 2L:TR9, 3P:M2-5
A basic botany course covering such topics as the structure, function, reproduction and uses of plants. Lectures and laboratories will also include a survey of the major plant groups. *E.R. Luck-Allen.*
- BIO 110 The Nature of Living Organisms**
(See description under "Biology")

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- BOT 200 Biology of Lower Plants** 2L:TR12, 3P:W9-12
A course on the biology of algae and fungi. Practical work is largely experimental, including use of pure culture techniques. Topics include: isolation and examination of fungi from environment; spore pollution of atmosphere; assay of fungi on human hair and skin; wine-making; luminescent fungi; special projects on detergent pollution and algal growth. A field trip is included. *J.F. Morgan-Jones*
Prerequisite: BIO 100/110/120 or BOT 100 recommended
- BOT 201 Systematic Botany** 2L:TR2, 3P:F9-12
An introductory course in vascular plant systematics. The flora of Ontario and familiar cultivated plants are used as examples of the more important families. *J.E. Cruise, J.W. Gear, Jr.*
Exclusion: BOT 300 (1970-71 Calendar)
Prerequisite: BIO 100/110/120 or BOT 100 recommended
- BOT 205 Evolution of Cultivated Plants** 2L, 2T L:T 6:30-8:30 p.m. T:R 6:30-8.30 p.m.
A course on the origin, evolution and biology of cultivated plants and their importance to human society. The history of cultivation, the differences between wild and cultivated plants, the methods of research for the production of new types, and finally the "green revolution", will be related to the genetical basis and illustrated with many examples. Tutorials will be used for demonstrations and research projects. *N.P. Badenhuizen.*
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 210 Morphology and Evolution in the Plant Kingdom** 2L:MW1, 3P:T9-12
A course on living and fossil representatives of the major plant groups, with emphasis on morphology, anatomy and evolution. *N. Dengler, P. Stokes*
Prerequisite: BIO 100/110/120 or BOT 100

- BOT 220 Plant Physiology and Biochemistry**
 2L, 1½P, 1T L:TR2, P1:M9-12, P2:F9-12, P3:R6.30-9.30p.m., T1:M10, T2:F10
 A basic course on the biochemistry, metabolism, growth and development and general physiology of plants. Practicals and tutorials will be given in alternate weeks. *K.R. Chandorkar, J.A. Hellebust, M.T. Tyree, J.P. Williams*
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 230F Plant Environment and Variation** 2L, 3P L:TR1, P1:R9-12, P2:F9-12
 A course dealing with the diversity of the environment and the opportunity afforded by this diversity for plant variation. Emphasis will be placed on competition, natural selection, adaptation and population diversity. Field work will include one weekend. *T.C. Hutchinson*
Exclusion: BOT 230
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 231S Plant Speciation** (Not offered 1973-74) 2L,3P
 This course deals with the factors responsible for the variation and evolution of plant species. Consideration will be given to such topics as sources of variability, reproductive systems, isolation mechanisms, adaptive responses, and the role of hybridization and polyploidy in evolution.
Exclusion: BOT 230 (1972-73)
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 232F Ecological Energetics and Productivity** 2L, 3P:N
 A course dealing with the productivity of various plant communities in diverse habitats and the reasons for production limitation. Energy flow through ecosystems in both laboratory and field situations will be considered as well as concepts of ecological efficiency. Energetics will be studied in terms of individuals, communities, and ecosystems. Field work may be included.
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 233S Physiological Ecology** 2L, 3P:N
 A course dealing with physiological aspects of plant ecology, especially physiological features of adaptation and diversity. Special emphasis will be placed on aspects of mineral nutrition, water relations and light response of plants in natural situations. Field work will be included.
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 234F Vegetational Dynamics** 2L, 3P L:TR1, P1:W5-8, P2:R9-12
 Succession, cyclical changes in vegetation and the population dynamics of plants will be dealt with. Some attention will be given to the evolutionary implications of the phenomena discussed. There will be one weekend field trip. *G.A. Yarranton*
Exclusion: BOT 330
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 235S Plant Distribution** 2L, 3P L:TR1, P1:W5-8, P2:R9-12
 Heterogeneity of vegetation at all scales will be covered. Topics will include the spatial pattern of individual species, species-abundance, and species-area relations, concepts of vegetation, properties of communities and phytogeographical distributions. There will be a weekend field trip in *October*. All students registered in the course must contact the instructor by September 23rd. *G.A. Yarranton*
Co-requisite: STA 222

- BOT 240 Cells and Organelles** 2L, 3P L:TR1, P1:T9-12, P2:R9-12
"The Key to every biological problem must finally be sought in the cell"—Wilson. The course views the cell as a dynamic molecular ecosystem. Evidence from biochemistry, light and electron microscopy is brought to bear on an understanding of the function and ultrastructure of the cell and its organelles. Selected topics include: cell division; structure and function of chromosomes and cytoplasmic organelles; cell culture, human chromosomes; DNA; transcription and translation of genetic information; evolution of cellular components. *T. Sawa, P. Sarkar, N.A. Straus*
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 251 Pathobiology of Plants** 2L:MW3, 3P:F9-12
 A basic course dealing with all factors that affect the normal growth of plants. Diseases, insect pests, weeds, and other injurious agents, are covered and modern control methods emphasized. *G.B. Orlab and Z.A. Patrick*
Exclusion: BOT 351 if taken concurrently
Prerequisite: BIO 100/110/120 or BOT 100 recommended
- COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS**
- BIO 300F Terrestrial and Freshwater Biology**
 See description under "Biology"
- BIO 301F Marine Biology**
 See description under "Biology"
- BOT 301 General Mycology** 1L:R1, 3P:F9-12
 An introductory course dealing with the morphology, life histories and distribution of various fungi with especial reference to their relation to human welfare. Field work and project work are included. *E.R. Luck-Allen*
Prerequisite: BIO 100/110/120 or BOT 100 recommended
- BOT 302F Phycology** 2L:MW1, 3P:T9-12
 The classification and the evolution of the Algal Divisions are discussed with emphasis on the laboratory study of the fundamental organization and the diversity demonstrated by fresh-water, marine, soil and air-borne algae. To be given in alternate years. *T. Sawa*
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 322F Photosynthesis** 2L:TR12, 3P:F9-12
 The physiology, biophysics and biochemistry of photosynthesis and related metabolic reactions, including chloroplast structure and development, carbohydrate, nucleic acid, lipid and protein metabolism. *J.P. Williams, J.A. Hellebust.*
Prerequisite: BIO 100/120 or BOT 220
Co-requisite: BCH 320/321 recommended
- BOT 323F Membrane Physiology** 2L:TR12, 3P:R9-12
 The transport of ions and water across cell membranes, particularly those of plants. The treatment will be basic, but will connect with the physiology of whole organisms and with plant ecology. *M.T. Tyree*
Prerequisite: Any first year course in calculus and CHM 120
- BOT 324S Physiology and Ecology of the Algae** 2L: MW1, 3P: T9-12
 Physiological and biochemical aspects of the growth and metabolism of algae, and their ecology. Planktonic freshwater and marine algae will be emphasized in the laboratory and field work. To be given in alternate years. *J.A. Hellebust*
Prerequisite: BIO 100/110/120 or BOT 100. (BOT 302F recommended)

- BOT 325S Plant Physiology** 2L, 1½P, ½T L:TR2, P1:M9-12, P2:F9-12, P3:R6.30-9.30p.m.
T1:M9, T2:F9
A basic course on the metabolism, growth, development and general physiology of plants. This half-course is recommended for students with a background in biochemistry. The lectures on general physiology will be given jointly to BOT 220 and 325S. Practicals and tutorials will be given in alternate weeks. *J.A. Hellebust, M.T. Tyree, J.P. Williams*
Exclusion: BOT 220
Co-requisite: BCH 320/321
- BOT 326S Physical Environment of Plants** (Not offered 1973-74) 2L, 2T
Physiological and ecological aspects of plant-water relations and solar energy exchange will be examined. The approach will be theoretical, but concepts will be illustrated with experimental data. To be given in alternate years. *M.T. Tyree*
Prerequisite: Any first year course in calculus and CHM 120
- BOT 327S Plant Biophysics** 2L: TR12, 2T: T9-11
Topics of current interest in plant physiology will be looked at from a basic, but essentially theoretical point of view. Such topics as translocation in phloem, symplastic transport, salt uptake by roots, growth will be included. To be given in alternate years. *M.T. Tyree*
Prerequisite: Any first year course in calculus and CHM 120 (BOT 323F recommended)
- BOT 340F Plant Structure and Development** 2L:MW1, 3P:M9-12
A course dealing with the structure of the cells, tissues, and organs of vascular plants. Emphasis is placed on the relationship of structure and function, the process of differentiation of specialized cells and tissues, and factors regulating development. *N.G. Dengler*
Prerequisite: BIO 100/110/120 or BOT 100
- BOT 341 Chromosomes and Evolution** (Not offered 1973-74) 2L,3P
The cytogenetics of plants and animals. Topics considered include (1) structure and ultra-structure of eukaryotic chromosomes, the integration of chromosomal DNA, its replication and diversification into unique and repeated DNA; (2) genetic parameters of meiosis: chiasma interference, chromatid interference, the relation between genetic and cytological maps; (3) changes of chromosome structure and number in individuals, populations and species; salivary gland chromosomes, sex determination, parthenogenesis, radiation damage and human cytogenetics. *K.H. Rothfels, N.A. Straus*
Prerequisite: BOT 240 recommended
- JBM 350 General Virology**
(See JBM under "Joint Courses")
- BOT 351 Plant Pathology** 1L:F1, 3P:W9-12, 1T:N
A course on the diseases of plants. Deals with effects of various causal agents such as bacteria, fungi, viruses, nematodes, and environmental factors including pollutants, on plant growth and productivity. *Z.A. Patrick.*
Exclusion: BOT 251 if taken concurrently
Prerequisite: BOT 200/251 recommended

COURSES OPEN TO FOURTH-YEAR STUDENTS AND TO
THIRD-YEAR STUDENTS BY PERMISSION

- BOT 400 Advanced Plant Systematics** 2L:TR10, 3P:M2-5, 1T:N
A seminar and project course dealing with speciation in higher plants, and with modern herbarium and laboratory techniques in taxonomy. *J.E. Cruise, J.W. Gear, Jr.*
Prerequisite: BOT 201

- BOT 401 Advanced Mycology** 4 hrs:N
A seminar and laboratory course in which students deal with individual topics and pursue special projects in Mycology. *R.F. Cain.*
Prerequisite: BOT 301
- BOT 402 Bryology** 1T,3P:N
The ecological and geographic distribution, morphology, taxonomy and identification of mosses and hepatics. *R.F. Cain*
- BOT 420S Growth and Development of Plants** 2L: TR12, ½T: N
An advanced course on metabolic patterns in development, hormonal control of growth and development, influence of light in relation to phytochrome and high energy reactions, and the role of these factors in the morphogenesis and induction of flowering. To be given in alternate years. Open to third year students by permission of the instructor. *G.F. Israelstam and J.A. Hellebust*
Prerequisite: BOT 220/325S
- BOT 421S Plant Cell Metabolism** (Not offered 1973-74) 2L, ½T
An advanced course on aspects of plant metabolism in relation to cell structure and function. Among areas to be covered are recent developments in carbohydrate, lipid and nitrogen metabolism, emphasizing control mechanisms. To be given in alternate years. Open to third year students by permission. *J.A. Hellebust, J.P. Williams*
Prerequisite: BOT 220 or BCH 320/321
- BOT 423 Radioisotopes in Biology** 1L:M5, 3P:N
The basic principles of tracer methodology and its application to problems of intermediary metabolism. The measurement of radioactivity and the practice of the use of radioisotopes will be discussed, also in relation to problems concerned with health hazards. *K.R. Chandorkar*
- BOT 430 Ecological Plant Geography and Palynology** 1L,3P:N
A course dealing with the origin and development of the vegetation of North America and with the techniques of pollen and macrofossil analysis of Quaternary deposits. *J.H. McAndrews*
Prerequisite: BOT 201 recommended
- BOT 434Y Applied Ecology** 1L: M11, 1T:N
Lecture and seminar course dealing with the application of ecological principles to problems of world food production, population growth, industrialization and air, soil and water pollution. Special attention is given to specific pollutants, their sources and effects, the use of plants as indicators and bioassay organisms, heavy metals, crude oil, pesticides, smelter fumes, fluorides, etc. One weekend field trip is optional. *T.C. Hutchinson*
- BOT 435Y Techniques in Applied Ecology** 3P P1: M2-5, P2:T2-5
A laboratory and project course dealing with the application of bioassay and analytical techniques in the assessment of environmental pollution. Project work is a major component of the studies. Aquatic and terrestrial plants are used as specific indicators and accumulators of pollutants. Air, soil and water pollution sources are considered. A weekend field trip is included. *T.C. Hutchinson*
Co-requisite: BOT 434Y
- BOT 440 Advanced Work in Cytology** N
This course is designed to accommodate advanced work in cytology and cytogenetics. It will involve experimental projects, participation in seminars and reviews of selected topics from the literature. The orientation is biological: microbial, plant and animal systems may be considered. Emphasis will be placed on (1) the application of salivary gland chromosome studies to problems of evolution, and (2) biophysical and biochemical studies of chromosomal DNA. *K.H. Rothfels, N.A. Straus*
Prerequisite: Recommended BOT 240, 341, ZOO 226, BCH 320/321

- BOT 441 Electron Microscopy** 1L,3P L:F2, P1:M9-12, P2:W9-12
A course on the techniques and applications of the electron microscope. Recent advances in ultrastructural cytology are discussed and students will practise the basic techniques. In view of limited facilities for practical work students are advised to register with the Department in advance. *N.P. Badenhuizen, T. Sawa*
Prerequisite: BOT 240
- BOT 450 Advanced Plant and Insect Virology** N
A seminar and laboratory course covering current research with plant and insect viruses. Students are instructed in the use of modern instrumentation and are given the opportunity to plan and execute their own experiments. *G.B. Orlob*
Prerequisite: JBM 350
- BOT 451 Physiology of Fungi and Parasitism** (Not offered 1973-74) 1L, 3P
A lecture and laboratory course on the growth, metabolism and parasitic activities of fungi and the physiology of the infected plant. To be given in alternate years. Open to third year students by permission of the instructor. *V.J. Higgins*
Prerequisite: BIO 100/110/120 or BOT 100 (BOT 200/251/351 recommended)
- BOT 455F Developmental Molecular Biology** N
An examination of recent information available on the molecular control of development in eukaryotes. Current ideas on the regulation of nucleic acid biosynthesis (nucleoproteins, hormones, "specificity factors") will be reviewed for plants, animals and eukaryotic microbes. An analysis of how current data fit into the theoretical models of gene regulation and development will be made. This course will consist of lectures and student discussions of appropriate articles. There will be a related laboratory course offered at Erindale. *P.A. Horgen*
Exclusion: BCH 425F
Prerequisite: BOT 240/ZOO 221 and BCH 320/321
- BOT 460 Project in Botany** N
A research project in some field of Botany, requiring the prior consent of a member of the department to supervise the project. The topic is to be one mutually agreed on by the student and supervisor before enrolment in the course; they must also arrange the time, place and provision of any materials. This course will normally be open only to fourth year students with adequate background in Botany.
Exclusion: BOT 461Y
- BOT 461Y Project in Botany** N
A research project in some field of Botany, requiring the prior consent of a member of the department to supervise the project. The topic is to be one mutually agreed on by the student and supervisor before enrolment in the course; they must also arrange the time, place and provision of any materials. This course will normally be open only to fourth year students with adequate background in Botany.
Exclusion: BOT 460

CHE **CHEMICAL ENGINEERING**
Courses Given by Members of the Faculty of Applied Science and Engineering

<i>Chairman of Department:</i>	Professor W.F. Graydon
<i>Department Counsellor:</i>	Professor M.E. Charles
<i>Enquiries:</i>	Wallberg Building, Room 2002 (928-3063)

Chemical engineering and applied chemistry is concerned with applications of chemical knowledge, chemical reactions and techniques for transforming raw materials such as water, inorganic chemicals, petroleum, wood and minerals into a wide range of chemical products and materials essential to our

economy. Thus, on the foundation of chemistry, physics and mathematics the chemical engineering student builds his mastery of chemical engineering principles and practice. Studies beyond basic studies in physical, inorganic and organic chemistry include the engineering of chemical reactions including the design and control of reactors which produce a complex mixture of products. The separation of these products into pure substances poses many challenging problems which require training in separation techniques such as distillation. The use and application of analog and digital computers to chemical engineering problems and to process control operations is increasingly important.

CHE 217F Inorganic Chemistry I 2L:MF9

Periodicity in physical and chemical properties of the elements are studied in relation to atomic structure. Descriptive chemistry of representative and some transition elements are correlated with structure. *Reference:* Mahan, *University Chemistry* (second edition). *R.E. Jervis*

Exclusion: CHM 230S, 235

Prerequisite: Departmental approval

CHE 218S Inorganic Chemistry II 2L:MF9

Useful quantum models are developed for atoms and for atomic and molecular orbital bonding mechanisms. Concepts discussed include: electro-negativity, Z-effective, ionic compounds, covalent bond lengths and energies, partial ionic character of bonds, coordination and complexation. *R. L. Hummel.*

Exclusion: CHM 230S, 235

Prerequisite: CHE 217F, departmental approval

CHM

CHEMISTRY

<i>Chairman of Department:</i>	Professor A.G. Brook
<i>Associate Chairman:</i>	Professor A.G. Harrison
<i>Enquiries:</i>	Lash Miller Building, Room 151 (928-6033)

Chemistry is both a challenging intellectual pursuit and a dominant force in shaping our modern civilization. Modern chemistry places a strong emphasis on an understanding of the structures and properties of individual atoms and molecules and on using this understanding to interpret and predict the behaviour of matter. Many of the concepts of Physics, and the methods of Mathematics are basic to Chemistry. Chemistry is, in turn, of fundamental importance to many other subjects ranging from the Biological and Medical Sciences to Geology, Metallurgy, and Astrophysics. These and other aspects of the subject are reflected in the courses offered and the programmes recommended by the Department of Chemistry.

The basic course offered in First Year is CHM 120 and should be chosen by all those who wish to continue the study of Chemistry in a later year or who require Chemistry as preparation for another science. Grade XIII Mathematics A (or MAT I) and Chemistry are the normal prerequisites for this course although students who lack Grade XIII Chemistry may obtain departmental permission to take the course provided they take a special two-hour per week tutorial during the fall term. (Students intending to register in CHM 120 without Grade XIII preparation are advised to consult the Department during the summer so that a suitable reading programme may be arranged prior to commencement of lectures.) In addition to these special tutorials, regular weekly tutorials will be held for all students as well as one afternoon (3½ hours) of laboratory every second week.

A second course, CHM 100, is specially designed for non-scientists to provide an insight into the impact of chemistry on our contemporary way of life. This course is not equivalent to Grade XIII Chemistry nor does it serve as a prerequisite for any other Chemistry course. It has no prerequisites and may be taken in any year, with the result that it can form part of a sequence with similar courses in the other sciences to give a non-scientist an overall view of the ideas and methods of science. These courses as well as more advanced courses available are described in this Calendar. More detailed descriptions including course lecturers are provided in the Department of Chemistry Handbook which will be available in the Department prior to the registration period.

Details of specialist programmes approved by the Department are presented elsewhere in this Calendar. These programmes: Chemistry, Chemistry (with Physics), Chemical Physics, Chemistry and Mathematics, and Chemistry and Biochemistry, have been designed to provide the student with an integrated series of courses, which, over the four years, will provide a sound background in the areas indicated by the programme titles. Completion of any one of these programmes will entitle students, if they wish, to have this fact noted on their academic transcripts. Students are free to deviate from these programmes and, indeed, to devise new programmes; however, prior consultation with the department(s) concerned is urged.

A student wishing more information about specific courses or career opportunities in Chemistry may obtain an appointment with one of the many professors involved in student counselling by visiting Room 151, Lash Miller Building (Telephone 928-6033).

The Chemistry Programme provides a basic core of Chemistry, with the necessary ancillary Mathematics and Physics, in the first three years, leaving the Fourth Year free for the student to choose courses reflecting his specific area of interest. This programme is suitable for entry into graduate work in any area of Chemistry.

The Chemistry (with Physics) Programme is similar to the Chemistry Programme but recommends the study of more Physics and is therefore particularly suitable for those students interested in the more physical areas of Chemistry. This programme is suitable for those who wish to continue into graduate work, particularly in Physical Chemistry, although preparation for graduate work in other areas is readily achieved through the choice of options in the final two years.

The Chemical Physics Programme is an interdisciplinary programme designed for those whose interests lie in the large area of science where Chemistry and Physics overlap. This programme is particularly suitable for graduate work in certain areas of Physical Chemistry and in Molecular Physics. Entry into research in areas of Chemistry other than Physical Chemistry is difficult but can be achieved if care is taken in the choice of options in the final two years.

The Chemistry and Biochemistry Programme is an interdisciplinary one designed for students whose interests incline towards Biochemistry or the biological areas of Chemistry. It is an especially appropriate preparation for graduate studies in these areas.

The interdisciplinary programme in Mathematics and Chemistry is challenging and should be attempted only by outstanding students. It is designed particularly for those intending to do graduate work in Theoretical Chemistry or Applied Mathematics and a well-rounded training in either may be obtained by a careful choice of options, particularly in the higher years.

COURSES OPEN TO FIRST- AND HIGHER YEAR STUDENTS

- CHM 100 Contemporary Chemistry** 2L, 1T:R7-9.30p.m.
 A course for those interested in learning something about modern chemistry and its relationship, dependency and impact on other fields of knowledge. Emphasis is placed on philosophical concepts of science and the role of chemistry in modern technological society.
- CHM 120 Basic Concepts of Modern Chemistry** 2L, 1½P, 1T
 OL1:TR9, NML2:TR11, OILT3:TR12, UVL4:MW1, L5:M7.30-9.30p.m.
 P1:M2-5.30, P2:T2-5.30, P3:W2-5.30, P4:R2-5.30, P5:W6.30-10.00p.m.
 Students should take practicals with the same section number as their lectures,
 T:N
 Atomic and molecular structure and theories of chemical bonding. Introduction to chemical energetics (thermodynamics, equilibrium, kinetics). The laboratory 3½ hours (alternate weeks) introduces synthetic and analytical techniques and applications of physical methods to problems in chemistry.
Prerequisites: XIII CHM, MAT A/MAT I (Functions and Relations). (Students with XII CHM and XIII MAT A/MAT I may enrol if they register with the department and take an additional two-hour weekly tutorial during first term)
Co-requisites: MAT 130/134/135/139/150

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- CHM 210F Analytical Chemistry** 2L:TR1
 Important principles of modern analytical chemistry are outlined. The application of analytical chemistry to solving urgent problems (environmental, industrial, space exploration, pure and applied research, etc.) is discussed.
Prerequisite: CHM 120.
- CHM 220 Introductory Physical Chemistry** 3L L1:MWF1, L2:MWF3, L3:W7-10p.m.
 Thermodynamics and application to phase equilibria and chemical equilibria including solution chemistry; electrochemistry; surface chemistry; colloid chemistry; reaction kinetics and catalysis; introductory quantum mechanics with applications to chemistry; spectroscopy with emphasis on applications.
Exclusion: CHM 221
Prerequisite: CHM 120, MAT 130/134/135/139/150
Co-requisite: None (MAT 230/234/235/239/250 strongly recommended).
 NOTE that CHM 320 requires at least MAT 234 as a prerequisite).
- CHM 221 Introductory Physical Chemistry** 3L,2P L1:MWF1, L2:MWF3, P1:T9-1, P2:F9-1
 The lectures in this course will be identical to CHM 220. The course differs in providing a 4-hour per week laboratory for half the year with selected experiments in physical chemistry. The sequence CHM 221-CHM 321 is identical with CHM 220-CHM 320.
Exclusion: CHM 220
Prerequisite: CHM 120, MAT 130/134/139/150
Co-requisite: None (MAT 230/234/235/239/250 strongly recommended. Note that CHM 321 has a prerequisite of at least MAT 234.)
- CHM 230S Introductory Inorganic Chemistry** 2L, 4P L:TR1, P1:W9-1, P2:R9-1
 Derivation of the shapes of simple covalent molecules, of Lewis acids and bases and of the structures of inorganic polymers. Structures of crystals and crystal forces. Stabilities in the solid state. Solutions, solubilities and solvation. Properties of hydrides and hydrogen, acids, bases and the hydrogen bond. Transition metals, their structures, isomerism, oxidation states and their electronic properties in relation to their colour, magnetism, stability and bonding.
Exclusion: CHM 235
Prerequisite: CHM 120
- CHM 240 Introductory Organic Chemistry** 2L, 2P L1:TR1, L2:TR2, L3:MW1, L4:T7.30-9.30p.m. P1:M9-1, P2:T9-1, P3:W9-1, P4:R9-1, P5:F9-1, P6:W6.30-10.30p.m.
 The chemistry and structure of carbon compounds are presented according to functional groups of increasing complexity and within the framework of modern structural theory. Some classes of organic compounds of special biological interest (carbohydrates, amino acids, steroids, terpenes) are discussed separately.
 In the laboratory students learn the basic laboratory techniques, carry out a number of syntheses and analyze organic compounds by chemical and spectroscopic methods. This course is intended primarily for students with interests in the life or health sciences who require a general, but rigorous, course in organic chemistry.
Exclusion: CHM 235/241
Prerequisite: CHM 120
- CHM 241 Introductory Organic Chemistry** 2L,2P L1:MW1, P1:T9-1, P2:W9-1
 The basic curriculum of this course parallels that of CHM 240 outlined above. However it will include some additional topics and will treat the subject in greater depth in both lecture and laboratory. It is recommended over CHM 240 for students wishing to follow any of the specialist programmes involving chemistry.
Exclusion: CHM 235/240
Prerequisite: CHM 120

CHM 323S **Quantum Chemistry**

CHM 324F **Crystal Chemistry**

CHM 350Y **Instrumental Methods of Analysis**

(These courses are described in the section which follows.)

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- CHM 320 **Physical Chemistry** 2L, 4P L:TR2, P1:T9-1, P2:F9-1
 Approximately one-half of the course will be concerned with statistical thermodynamics, statistical mechanics and their applications to chemical problems. The remainder of the course will be concerned with the thermodynamics of non-ideal systems and with other topics in physical chemistry. The laboratory will consist of a selection of experiments in physical chemistry.
 Note: The content of this course will change in 1974/75 as a result of the changes made this year in CHM 220. The combination of CHM 220 (1972-73 or earlier) and CHM 320 (1974-75 and later) is undesirable. Students who require both courses as part of their programme and who have completed CHM 220 should take CHM 320 this year.
Exclusion: CHM 321
Prerequisite: CHM 220, MAT 234/235/239/250
- CHM 321 **Physical Chemistry** 2L,2P L1:TR2, P1:T9-1, P2:F9-1
 The lectures in this course will be identical to CHM 320. The laboratory will be one-half the laboratory of CHM 320 and will consist of a selection of experiments in physical chemistry.
Exclusion: CHM 320
Prerequisite: CHM 221, MAT 234/235/239/250
- CHM 323S **Quantum Chemistry** (Not offered after 1973-74) 2L:TR3
 A mathematical approach to quantum chemistry leading to a treatment of: electronic structure of atoms; molecular orbital and valence bond theory; rotational, vibrational and electronic spectroscopy.
Prerequisite: MAT (140 & 150)/235/239
Co-requisite: CHM 220/221
- CHM 324F **Crystal Chemistry** 2L:TR3
 Nature of crystals; the unit cell; symmetry. Diffraction and crystal structure analysis. Types of crystal structures, various applications of crystallography. Crystal defects.
Prerequisite: CHM 120
- CHM 325F **Macromolecular Chemistry** 2L:TR4
 An introduction to the organic and physical chemistry of large molecules. The structure and synthesis of important polymers involved in the industrial technology of synthetic fibers and plastics is described, along with an outline of the structure of biological macromolecules. Particular emphasis is given to the application of physicochemical methods.
Prerequisite: CHM 220/221/235/240/241
- CHM 330 **Inorganic Chemistry** 2L, 4P L:MW5, P1:M9-1, P2:T9-1
 The first part of the first term is concerned with the chemistry of the halogens, covalent halides, rare gas compounds and hydrides. Then follows a discussion of the properties of metals, intermetallic compounds, and of interstitial and non-stoichiometric compounds. The second term is devoted to the chemistry of the transition metals, coordination complexes, aspects of bonding and spectra, π -bonded ligands, and organometallic chemistry. The laboratory is concerned with preparative, analytical and spectroscopic aspects of inorganic compounds.
Prerequisite: CHM 235/230S (CHM 220/221 and 240/241 are recommended)

- CHM 340 **Organic Chemistry** 2L, 4P L:MW4, P1:R9-1, P2:F9-1
 The stereochemistry of organic compounds and the relationship of this to physical and chemical properties. The reactivities of organic compounds and the factors affecting the equilibria and rates of reactions. The mechanisms of organic reactions and the reactive intermediates involved. The major classes of organic reactions: addition, substitution, radical reactions, molecular rearrangements, oxidation and reduction. The application of these reactions in the synthesis of organic compounds in both lectures and laboratory. This course is designed primarily for students wishing more organic chemistry than provided by CHM 240/241 either as a free option or as a co- or pre-requisite for courses in other disciplines.
Exclusion: CHM 341
Prerequisite: CHM 235/240/241
- CHM 341 **Organic Chemistry** 2L:MW2, 4P:T9-1
 The content of this course will be similar to that of CHM 340 described above. It will differ from CHM 340 in that additional material and more extensive discussion of various topics will be included to make the course more useful and satisfying for students with a basic interest in chemistry. It is recommended over CHM 340 for those students following a specialist programme involving chemistry.
Exclusion: CHM 340
Prerequisite: CHM 235/240/241
- CHM 347S **Organic Chemistry of Biologically Important Compounds** 2L:TR4
 A survey of the chemistry of the main classes of naturally-occurring organic compounds. Discussion of structure, properties and synthesis of selected compounds in each group. Classes of compounds to be studied include: amino acids, peptides, proteins; carbohydrates, nucleosides, nucleotides, nucleic acids; terpenes, steroids; alkaloids; etc.
Co-requisite: CHM 340/341
- CHM 350Y **Instrumental Methods of Analysis** 4P P1:W9-1, P2:R9-1
 A laboratory course that will focus on some facets of measurement systems, with the emphasis on interpretation of observed facts, using sophisticated equipment to stimulate useful thinking in analytical problem solving.
Prerequisite: CHM 230S/235/240/241
Co-requisite: CHM 220/221
- CHM 422F **Fundamentals of Quantum Mechanics**
- CHM 423S **Approximation Methods in Quantum Chemistry**
- CHM 424F **Theory of Spectroscopy I**
- CHM 425S **Theory of Spectroscopy II**

(These courses are described in the section which follows.)

COURSES OPEN TO FOURTH-YEAR STUDENTS

- CHM 420 **Theory of Reaction Kinetics** 2L:MW2
 A review of the status of the theories of chemical kinetics including a discussion of the following topics: classical collision theory, transition state theory, potential energy surface, tunnelling and kinetic isotope effects, intermolecular potentials, theories of unimolecular, bimolecular, termolecular, and more complex reactions.
Prerequisite: CHM 320/321

- CHM 422F **Fundamentals of Quantum Mechanics** 2L:TR3
 The course studies the general formalism of quantum mechanics and the use of various representations for quantum mechanical results, along with a discussion of "spin" and angular momenta.
Prerequisite: CHM 323S/PHY 300
- CHM 423S **Approximation Methods in Quantum Chemistry** 2L:TR3
 The course examines the theory and applications of perturbation and variation methods, and in particular discusses Hartree-Fock approaches to atomic and molecular problems, and the problem of electron correlation.
Prerequisite: CHM 323S (CHM 422F is desirable)/(PHY 300 and extra reading)
- CHM 424F **Theory of Spectroscopy I** 2L:TR4
 Theory of radiation, time dependent perturbation theory, transition probabilities, oscillator strength, stimulated emission; atomic spectra; UV, visible, IR and Raman spectroscopy with an emphasis on diatomic molecules.
Prerequisite: CHM 323S
- CHM 425S **Theory of Spectroscopy II** 2L:TR4
 Symmetry in spectroscopy; ESR,NMR,NQR; Optical activity
Prerequisite: CHM 424F
- CHM 428 **Introduction to Research in Physical Chemistry** N
 An experimental or theoretical research problem under the supervision of a member of the Physical Chemistry staff. Students are expected to spend approximately 260 hours throughout the year. Enrolment in this course may be restricted and must be approved by the Department. Applications for enrolment should be made to the Department in the spring prior to entry into Fourth Year.
Exclusion: CHM 429Y/CHM 439Y/CHM 449Y
Prerequisite: CHM 320/321, Departmental approval
- CHM 429Y **Introduction to Research in Physical Chemistry** N
 An experimental or theoretical research problem under the supervision of a member of the Physical Chemistry staff. Students are expected to spend approximately 130 hours throughout the year. Enrolment in this course may be restricted and must be approved by the Department. Applications for enrolment should be made to the Department in the spring prior to entry into Fourth Year.
Prerequisite: CHM 320/321, Departmental approval
- CHM 430F **Theoretical Inorganic Chemistry I** 2L:TR10
 This course covers the theory of the main spectroscopic methods in inorganic chemistry. The subject matter concerns the applications of group theory to inorganic problems, the electronic structure of transition metals in various crystal fields, the applications of infrared, Raman and electronic spectroscopy. The course is essentially non-mathematical and focused mainly on structural problems.
Prerequisite: CHM 330
- CHM 431S **Theoretical Inorganic Chemistry II** 2L:TR10
 Theory of transition metal compounds. (i) Crystal field theory. Slater's treatment of atoms, with applied ligand field for high and low spin systems. Spin orbit coupling. (ii) Molecular orbital treatment. Methods of evaluating integrals. (iii) Some comparisons of theory with experiment, and trends in the chemistry of transition elements.
Prerequisite: CHM 330

- CHM 435 Topics in Inorganic Chemistry** 2L:TR2
 A series of topics on areas of current interest in inorganic chemistry. Topics will be selected so as to cover a wide range of interests, some examples of which are: catalysis; conformational analysis and optical activity, biological inorganic chemistry; reactivity of coordinated ligands; transition metal carbonyls; boranes; carboranes and complexes thereof; fluxional molecules; organo-transition metal chemistry; metal-metal bonds; chemistry of the lanthanides and actinides.
Prerequisite: CHM 330
- CHM 438F Advanced Inorganic Chemistry Laboratory** N
 A laboratory, open throughout the day for the second half of the first term, in which students are instructed in the use of modern instrumentation and techniques and are given the opportunity as an introduction to work in a research laboratory; to plan and execute independent projects. Students are expected to spend approximately 130 hours during the period specified. Enrolment in this course may be restricted and must be approved by the Department. Applications for enrolment should be made to the Department in the spring prior to entry into Fourth Year.
Exclusion: CHM 448F
Prerequisite: CHM 330 (CHM 320/321, 340 strongly recommended, CHM 350Y desirable)
 Departmental approval
- CHM 439Y Introduction to Research in Inorganic Chemistry** N
 An experimental or theoretical research problem under the supervision of a member of the Inorganic Chemistry staff. Students are expected to spend approximately 130 hours throughout the year. Enrolment in this course may be restricted and must be approved by the Department. Applications for enrolment should be made to the Department in the spring prior to entry into Fourth Year.
Exclusions: CHM 428/429/449Y
Prerequisite: Departmental approval
Co-requisite: CHM 438F
- CHM 440F Synthetic Organic Chemistry** 2L:TR12
 A selection of reactions of synthetic value is discussed with emphasis on application of the reactions to preparative organic chemistry. An attempt is made to systematize and rationalize the material presented.
Prerequisite: CHM 340/341
- CHM 441S Structural Organic Chemistry** 2L:TR12
 The application of infrared, ultraviolet, nuclear magnetic resonance, and mass spectroscopy to the determination of the structures of organic compounds.
Prerequisite: CHM 340/341
- CHM 444F Kinetics and Mechanism in Organic Chemistry** 2L:TR11
 Non-kinetic and kinetic methods of studying reaction mechanisms. A review of elementary rate processes and multistep chemical reactions. Correlation between structure and reactivity.
Prerequisite: CHM 220/221, CHM 340/341
- CHM 445S Molecular Orbital Theory in Organic Chemistry** 2L:TR11
 Application of the Huckel molecular orbital HMO approach to simple organic π -systems. The use of elementary group theory to treat larger π -systems. Huckel's rule and aromatic character. Correlations of HMO results with experimental data. Basis of the Woodward-Hoffman selection rules.
Prerequisite: CHM 220/221/340/341

- CHM 447S Biological Organic Chemistry** 2L:MW12
 The chemistry, including stereochemistry and mechanisms, of enzymic and other processes of metabolism and reproduction in living systems.
Prerequisite: CHM 347S/BCH 321
Exclusion: BCH 424S
- CHM 448F Advanced Organic Chemistry Laboratory** Arranged
 A laboratory, open throughout the day for the first six weeks of the term in which students are instructed in the use of modern instrumentation and techniques and are given the opportunity, as an introduction to work in a research laboratory, to plan and execute independent projects. Students are expected to spend approximately 130 hours during the period specified. Enrolment in this course may be restricted and must be approved by the Department. Applications for enrolment should be made to the Department in the spring prior to entry into Fourth Year.
Exclusion: CHM 438F
Prerequisite: CHM 340/341, Departmental approval
- CHM 449Y Introduction to Research in Organic Chemistry** Arranged
 An experimental or theoretical research problem under the supervision of a member of the Organic Chemistry staff. Students are expected to spend approximately 130 hours throughout the year. Enrolment in this course may be restricted and must be approved by the Department. Applications for enrolment should be made to the Department in the spring prior to entry into Fourth Year.
Exclusions: CHM 428/429Y/439Y
Co-requisite: CHM 448F
- CHM 470 Approved Graduate Course** Arranged
 Any chemistry course or two half courses listed in the graduate calendar which are not also listed in the Arts and Science Calendar. Must be approved by the Department.
Exclusions: CHM 471Y
Prerequisite: Departmental approval
- CHM 471Y Approved Graduate Half-Course** Arranged
 Any chemistry half-course listed in the graduate calendar which is not also listed in the Arts and Science Calendar. Must be approved by the Department.
Exclusions: CHM 470
Prerequisite: Departmental approval

CHINESE - See "East Asian Studies" (EAS)

CINEMA - See "Innis College Courses" (INI)

CIV

CIVIL ENGINEERING

Given by the staff of the Faculty of Applied Science and Engineering

<i>Chairman of Department:</i>	Professor T.C. Kenney
<i>Departmental Counsellor:</i>	Professor P.M. Wright
<i>Enquiries:</i>	Galbraith Building, Room 216 (928-3099)

The Department of Civil Engineering is very much aware of the growing interest in and need for interfaculty studies. Accordingly it is anticipated that in the coming years, a number of its courses can

be made available to students in the Faculty of Arts and Science. The first one, CIV321F, will be of particular interest to students whose programmes emphasize geology.

COURSE OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

CIV 321F Soil Mechanics 2L, 2P L1:T10, R2, P1:W10-12, P2:R3-5, P3:M10-12, P4:F10-12
 Identification and classification of soils for engineering purposes; properties, permeability and drainage characteristics, effective stresses, consolidation and settlement, shearing strength, compaction, stabilization, frost action. Laboratory sessions include identification of soil samples and determination of mechanical properties of soil.
Prerequisite: GLG100, PHY110/130/150, Departmental approval

CLA

CLASSICS

Chairman of the Intercollegiate Department: Professor D.J. Conacher, Trinity College, 928-3055
Secretary: Professor K.R. Thompson, Victoria College, 928-3940
Chairmen of College Departments:
University College: Professor G.V. Sumner (928-3178)
Victoria College: Professor G.L. Keyes (928-3911)
Trinity College: Professor J.W. Cole (Acting) (928-3006)
St. Michael's College: Professor the Reverend J.J. Sheridan (928-3151)

Academic Advisers:

University College: Professors Derow, Mason, Sumner
Victoria College: Professors Keyes, Thompson
Trinity College: Professors Cole, McDonough
St. Michael's College: Sister M. Blandina, Rev. J.J. Sheridan

The field of Classics is concerned with the linguistics, literature, philosophy, religion, politics, and history of Greece and Rome. For the linguist, Greek provides an unbroken tradition from the earliest to modern times; while the relationship of Latin with the Romance Languages affords a valuable check on the comparative method of linguistics.

Students and lovers of literature are introduced to early and often unsurpassed works in every *genre* which have contributed form, content, and critical standards to every European literature. The philosopher encounters the seminal ideas of European philosophy clearly and simply expressed. The political scientist observes a people, passionately interested in both the theory and practice of politics, who explored the possibilities of elitist governing groups, enlightened and unenlightened despotism, and democracy, singly and in a variety of combinations, in national, federal and imperial contexts, and on every scale from city state to "world empire". Students of religion discover a rich variety of religious experience, interesting in itself and for its formative influence upon Christianity and Islam. The historian, with an entire civilization before him from beginning to end, can compare it with his own, and can trace the evolution of a single great social experiment from its first creative phase, through its mature achievement, to its final period of consolidation—and obsolescence. Classical language, literature, philosophy, political experience, religion, law, art, architecture, and Euclidean mathematics are still factors in our lives, and our understanding of the present will be enhanced by some understanding of these formative influences from the past.

The Department of Classics is now also offering courses in Modern Greek Language and Literature. Many of the ancient literary motifs survive in the themes of contemporary authors and of the popular poetry of modern Greece. Since Independence, Greece has produced poets and novelists of prime importance, whose works have influenced the literature of other Western countries.

Students who wish to specialize in classical studies may participate in Programmes in Classics,

Greek, Latin, and Greek and Roman History, beginning in the Second Year. For those who wish to combine their studies of Latin or Greek with other disciplines, the Department of Classics is cooperating with other departments in joint programmes. Programmes now exist which combine Latin or Greek with other languages, and Greek with philosophy. Other combinations can be designed to suit the interests of individual students. The programmes described elsewhere in this Calendar under the heading "B.A. Programmes" lead to certification as a specialist.

Graduates of these programmes generally teach in schools and universities. They are eligible for Type A certificate programmes at The Faculty of Education, and for admission to graduate and professional studies here and abroad.

The Department of Classics welcomes students of all academic backgrounds who wish to take courses in the field but do not wish to specialize in Classical Studies. Students need not know Greek or Latin to study Greek and Roman History or Greek and Latin Literature in Translation. Of course advanced work in Greek and Latin does require study of the basic language courses in sequence.

The courses offered by the Department of Classics are listed in the body of the Calendar under the headings GLL (Greek and Latin Literature in Translation), GRH (Greek and Roman History), GRK (Greek), and LAT (Latin). The courses in Modern Greek are numbered GRK 150, 245, 250, 350, 450. The Department also cooperates with the Department of History in offering the courses coded HIS 485 (The Problem of Government in Classical Greece) and HIS 486 (From Republic to Principate). The Department of Near Eastern Studies offers courses in Hellenistic Greek listed as NES 251, NES 351, NES 451.

The Department of Classics publishes a brochure which may be obtained from the chairmen of College departments before pre-registration. They can also provide information regarding instructors and the courses they teach, in cases where they are not named in course descriptions.

CLB

CLINICAL BIOCHEMISTRY

Given by the staff of the Faculty of Medicine

<i>Chairman of Department:</i>	Professor A.G. Gornall
<i>Co-ordinator of Undergraduate Studies:</i>	Professor J.A. Kellen
<i>Enquiries:</i>	Banting Institute, 100 College St., Room 415 (928-2663, 928-2664)

CLB 401 Biochemistry of Human Diseases

2L:TR1, 2T:T2-4

Lectures will deal with mechanisms by which defects that are inherited, or acquired through a disease process, may result in biochemical and functional alterations. Processes directed toward maintaining homeostasis, and the contribution of biochemical data to the problems of diagnosis, treatment and prognosis, will be discussed. Seminar classes are based on case histories selected to illustrate the associated biochemical and functional derangements. Intended for life science students who may be considering a career in clinical biochemistry, in biomedical research, or in medicine.

Prerequisites: BCH 321 and PSL 321/322 or BCH 320 and PSL 322

COM

COMMERCE

<i>Supervisor of Studies:</i>	Professor J.E. Smyth
<i>Enquiries:</i>	Sidney Smith Hall, Room 3027 (928-3339)

The objective of the programme in Commerce and Finance is to help students develop the analytical abilities needed for solving problems and making decisions in business and government and for participating in and contributing constructively to our society generally.

The programme at the University of Toronto has long had a strong and unique economics content—one that equips graduates particularly well for the 1970's in view of the increasing interaction between the private and public sectors of our economy and the special social, economic, and business problems that face us as a nation. It incorporates this philosophy by requiring the same minimum number of courses in each of Economics and Commerce.

The programme offers the student a foundation on which to build managerial and professional skills. Areas of study embrace the economic and legal environments of the enterprise, the determinants of organizational strategy, and the problems of achieving effectiveness within an organization.

The earlier parts of the programme emphasize studies of the accounting system that provides a basis for the flow of information within a business and to investors, of the economic factors that shape competitive and cooperative action in society and, generally, of the structure of our economic and social institutions.

More senior courses then build on these subject areas by dealing in depth with administrative and organizational behaviour, accounting policies and research, and marketing, production and financial strategies.

The programme also gives attention to the public sector and recognizes the increasing importance of applying administrative skills in the management of governmental institutions.

A student may design a programme for a B.Com. degree in such a way as to place special emphasis in third and fourth years on one or more of the general areas of commerce, economics, and accounting and finance, depending upon his plans for the future.

Students who choose to emphasize commerce tend to accept positions with companies or the government service on graduation or to undertake further studies at the graduate level in business administration or law. It is also possible for these students to take a sequence of courses in Actuarial Science with a view to making some progress towards qualification as an actuary.

Students who choose to emphasize economics may make a number of sub-choices within the field—for example, in economic theory, in mathematical economics, in economic history, and in economic development. A significant number of students who have made this choice have then undertaken graduate studies in economics and some have proceeded to academic careers.

Students who choose to emphasize accounting and finance may make careers in the accounting profession and in the financial world; typically about one-third of the class has been so inclined in recent years.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

COM 100 **Financial Accounting**

3L L1:TR9, T2; L2:TR11, T4; L3:TR12, R2; L4:TR3, R4; L5:TR4, R5

Basic theory and concepts which underlie the preparation of financial statements; development of double entry theory and practice; the accounting cycle from the recording of transactions in double entry form to the year-end entries and the preparation of financial statements; problems of measuring income. Enrolment is strictly controlled. Students who are not initially accepted must consult with the Department of Political Economy.

COM 101 **Industry and Trade**

2L:TR2

A general introduction to the world of commerce, finance, industry and trade including an examination and analysis of our basic economic structure and institutions. Attention is drawn to current developments and students are encouraged to establish their own special areas of interest.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

COM 221F **Management Accounting**

2L L1:TR9, L2:M4-6, L3:T4-6, L4:TR10, L5:MW10

This course introduces management control through case discussions and a computerized management game. It examines the following topics: the relationship between cost, volume and profit; variable costing and decision-making; the absorption-variable costing controversy; overhead allocation; job order and process cost systems; and the use of pre-determined costs (estimated and standard costs). Enrolment is strictly controlled.

Prerequisite: COM 100

- COM 222S **Information Systems & Control** 2L L1:TR9, L2:M4-6, L3:T4-6, L4:TR10, L5:MW10
 The course includes information system theory, control theory and practice, relevant costs, responsibility accounting, and a survey of selected management science techniques. Through case discussions, interrelationships between information and control systems, managerial style and human behaviour are established. Enrolment is strictly controlled.
Prerequisite: COM 221F

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- COM 300 **The Legal Environment of Business** 2L L1:TR9, L2:R4-6
 The course has two main purposes: to develop an approach to reaching decisions objectively, and to examine how the law, as an institution, accommodates business convenience and social policy. In addition, the course examines the nature of legal devices that are commonly encountered in the operation of a business. To a large degree the lecture periods take the form of class discussion of cases and of topical matters related to business law. In the event that space is inadequate, priority will be given to Third Year students in Commerce & Finance.
Prerequisite: ECO 100/102
Co-requisite: COM 221F and COM 222S
- COM 301 **Canadian Public Administration** 2L:TR3
 This course will deal with public administration in Canada at all three levels of government. Some material may be drawn from other jurisdictions for comparative purposes. Among the topics discussed will be: differences between private and public administration; structure of administration; management in the public service; financial administration; personnel; administrative responsibility.
Exclusion: POL 322
Recommended preparation: COM 100
- COM 303S **The Public Corporation** 2L:R4-6
 This course deals with that special group of non-departmental organizations used by governments for the conduct of enterprises that have their counterparts in the private sector. The rationale for such undertakings, their legal base, problems with the board form of management, their mode of financing and staffing, and the means by which they are held accountable are examined by selected reference to Canadian, British and U.S. practices.
- COM 320 **Financial Accounting Theory and Policy** 2L L1:TR11, L2:T4-6, L3:TR3
 An extension of financial accounting topics previously covered, this course emphasizes areas of current concern such as: inventory valuation; accounting for fixed assets and intangibles; corporate reorganizations; and inter-corporate investments. The case method of instruction is used extensively. This course cannot be taken in the same session as COM 221F or 222S. In the event space is inadequate, priority will be given to students who have completed COM 221F and 222S.
Prerequisite: COM 100
- COM 324F/S **Investments** 2L:MW3
 This course considers the principles and risks underlying various investment media such as shares, bonds, life insurance, real estate, mortgages and mutual funds. It also examines the sources of financial information critically.
Exclusion: COM 424
Prerequisite: COM 100, & ECO 202
Co-requisite: COM 221F & 222S or COM 320

- COM 331 **Business Finance** 2L:TR2
 This course is designed to develop an understanding of corporate financial behaviour and practice. It proceeds by a combination of lectures and case studies. Topics include capital budgeting, leasing, the financial problems of small business, public financing and underwriting, venture capital, mergers and acquisitions, and the use of surplus funds. In addition, the course reserves some time for discussion of topical matters especially affecting business finance in Canada.
Exclusion: COM 421
Prerequisite: COM 100 & ECO 100
- COM 333F **Formal Organizations—I** 2L:Evening
 The focus in this course will be upon the functions of social forces affecting administration. The course will analyse the social conditions requisite for the development of bureaucracy, the structure and functions of bureaucratic, formal organization, the informal structure within formal organizations, and organizational adaptation to community values and social structure. It will examine these major topics in the light of sociological theories supported by case studies on bureaucracy and industrial work relationships.
Exclusion: COM 335F, SOC 314
Prerequisite: Introductory course in SOC, POL or ECO
- COM 334S **Formal Organizations—II** 2L:Evening
 A continuation of the studies described in COM 333F.
Exclusion: COM 336S, SOC 314
Prerequisite: COM 333F
- COM 335F **Social Factors of Administration—I** 2L:Evening
 This is a course in the sociology of bureaucracy and administrative organization, emphasizing the environmental contexts of administrative decisions and their relation to the internal processes of organizational change.
Exclusion: COM 333F, SOC 314
Prerequisite: Introductory course in SOC, POL or ECO
- COM 336S **Social Factors of Administration—II** 2L:Evening
 A continuation of the studies described in COM 335F.
Exclusion: COM 334S, SOC 314
Prerequisite: COM 335F
- COM 400 **Marketing** 2L L1:M4-6, L2:W4-6
 This course covers consumer behaviour and the managerial functions of marketing with emphasis on information acquisition.
Prerequisite: COM 221F & 222S
- COM 401 **Principles of Administration** 2L L1:TR10, L2:TR12
 Examination of the essential processes of management or administration is the purpose of this course. These processes include organization, planning, leadership, and control; each of them is an integral part of the direction of every enterprise. There is study of current administrative practices and problems. Students are encouraged to identify and explore their own special areas of interest.
Prerequisite: COM 221F & 222S
- COM 422 **Analysis of Production Systems**

(This course is described in the section which follows.)

COURSES OPEN ONLY TO FOURTH-YEAR STUDENTS

- COM 420 **Accounting Literature & Research** 2L:W9-11
 This course will take the form of a seminar for the critical discussion of research bulletins and monographs of the leading accounting bodies in Canada, the United States and Britain, of articles in current issues of accounting journals, and of classic articles in books of readings. Its purpose is to provide a review of contemporary and controversial issues in accounting theory. Enrolment is limited to twenty students.
Prerequisite: COM 320
- COM 421 **Corporation Finance** 1L, 1T L:R2, T1:T2, T2:M2, T3:W2, T4:W3
 The purposes of this course are to explain the financial environment within which Canadian companies operate, to develop the main principles of financial management, and to examine the social and legal significance of the corporation as one of the dominant institutions of modern society. One of the two hours each week takes the form of a smaller tutorial group for discussion of cases in finance and of topical developments in Canadian finance. Available only to students in the fourth year of the Programme in Commerce & Finance. Other students wishing a course in Finance must take COM 331.
Prerequisite: COM 221F & 222S and ECO 202
- COM 422 **Quantitative Systems Analysis** 2L:M4-6
 This course deals with systems analysis and operations research for decision-making, mainly with reference to planning, managing and controlling production systems. Assigned problems cover such techniques as breakeven cost analysis, return on investment evaluation, plant layout and process balancing, linear programming, critical path planning, adaptive forecasting, statistical quality control, queueing theory, inventory control and system simulation models.
Prerequisite: COM 221F & 222S. Some elementary background in linear algebra is recommended and MAT 134 is strongly recommended (will be required in 1974-75)
- COM 423 **Canadian Business Taxation** 2L L1:T4-6, L2:R4-6
 The course is basically designed to provide Commerce & Finance students with an introduction to both the technical provisions and broad policy issues involved in taxation of business enterprises in Canada. The emphasis in the course is therefore of a dual nature, including both a development of an understanding of technical income tax provisions and a review of major policy issues.
Prerequisites: COM 221F & 222S. In the event enrolment has to be limited, preference will be given to students who have also completed ECO 202 or who (if specially registered) hold a university degree.
- COM 425 **Managerial Economics** 2L:M4-6
 The course focuses on the theory and operation of the firm. At the beginning consideration is given to the tools necessary to develop the theory, for example, static and dynamic optimization. Topics discussed include the nature of the profit maximizing firm, optimal advertising strategy, empirical demand and supply analysis, risk and uncertainty, non-profit theories of the firm, the regulated firm, and capital theory and investment behaviour. May be regarded as a course in either Commerce or Economics for the purpose of satisfying the minimum number of courses in Commerce and Economics.
Prerequisite: MAT 134 & ECO 200/241S

<i>Chairman of Department:</i>	Professor T.E. Hull
<i>Undergraduate Secretary:</i>	Professor S.A. Cook
<i>Student Adviser:</i>	Mrs. M. Chepely
<i>Enquiries:</i>	McLennan Physical Laboratories Room 1317 (928-6360)

Computer science is concerned with information processes, their representations and their implementation in machines. It is also concerned with relationships between information processes and classes of problems that give rise to them, and with general methods for solving problems with the help of information processing machines.

The computer provides a scheme for transforming the abstract specification of an information process into an operating machine. Hence the computer and the phenomena surrounding it are the main objects of study in computer science.

The concept of a procedure—an algorithm—is also of primary significance to computer science. A computer program is a procedure in a computer language that expresses a method of carrying out a desired information processing function, such as to find solutions for a given class of problems. The conception, formulation, computer implementation, analysis and evaluation of procedures for a broad variety of problems constitute a major part of the activity in computer science. Closely associated with these activities are efforts to develop tools for building and executing programs, and to design software and hardware systems.

The development of computer science has been strongly stimulated by demands for the application of computers in almost every discipline: in mathematics (investigations of finite topological spaces, coset enumerations, deduction); in chemistry (organic synthesis, interpretation of spectrograms, formation of structural models for large molecules); in urban and regional planning (transportation networks, design, simulation, optimization); in language and literature (phonology, grammatical structures, studies in style).

The course offerings in Computer Science are intended to serve a wide variety of students.

The programme in Computer Science is designed to provide a student with the knowledge and skills needed to hold professional positions in the computer field and to prepare him for further graduate study in computer science.

The programme for Data Management is intended for students who plan to pursue a career in information systems development, an area of increasing importance to business, industry and government. A student from this programme may continue with graduate study in computer science. If certain optional courses in Commerce, or their equivalents in the Faculty of Management Studies, are taken in the third and fourth years, a student in this programme may qualify for advanced standing toward the MBA degree.

Students who wish to combine a strong “minor” in computer science with courses in another area of interest, be it in the physical, social, or life sciences, or the humanities, should begin with CSC 148F and CSC 158S, followed by a selection from CSC 258F, 248S, 228S, 236S, 358S, 378F.

Students who wish to study computing primarily in order to use computer techniques in their own specialties should begin with CSC 108F and CSC 118S. A number of applications courses are then available in the second and later years. CSC 236S is recommended for science students. CSC 208S, 218F, and 358S are other possibilities.

An increasing number of courses are scheduled during evening hours and in the summer. The intention is to allow the part-time student to pursue either specialist program through the Division of University Extension.

The student who wishes to emphasize the hardware aspects of Computer Science should consider enrolling in Engineering Science, where he can take the Computer Science option in third and fourth years.

Tutorials are associated with almost all courses in Computer Science. It is hoped that through individual instruction each student will be able to develop his own interests to best advantage.

A more detailed guide to the undergraduate programs in Computer Science is available upon request from the Student Advisor. A list of instructors will be appended to the April issue of the guide.

The University of Toronto Computer Centre provides general computational services for the research and teaching departments of the University. The equipment currently installed at the Computer Centre includes an IBM System/370-165 for batch computing (including use of the High Speed Job Stream) from numerous remote stations located about the campus, an IBM System/360-65 to support interactive computing, and an IBM 7094 II for special scientific applications. Other facilities are available for special purposes such as systems programming and computer graphics. All major programming languages are available.

- CSC 108F/Y Computer Programming** 108F:2L, 1T:MWF10 108Y: 1L, 1T:TR1
 Introduction to algorithms, computer organization and assembly language. Emphasis will be placed on learning to program in a high level language. Applications. (This course is especially for students who want to learn programming for use in their own areas of interest.
Exclusion: CSC 148F
Prerequisite: XII MAT
- CSC 118S Programming Applications** 2L, 1T: MWF10
 A continuation of CSC 108F. Practical approaches to solving problems using a digital computer: numerical computations, statistical calculations, simulations, data processing and nonnumerical calculations.
Exclusion: CSC 158S
Prerequisite: CSC 108F/Y/148F
- CSC 148F Introduction to Computing** 2L, 1T:MWF10
 Introduction to algorithms and problem solving with computers. Programming in a high level language such as PL/I. Structured programming. Illustrative applications. Elementary computer organization, assembly language, and compiling techniques. (This course is more intensive than 108F/Y and is intended for students who plan to pursue the specialist program either in Computer Science or Computer Science for Data Management or who wish to have a strong minor in Computer Science.)
Exclusion: CSC 108F/Y
Prerequisite: XIII MAT Functions and Relations, Calculus
Co-requisite: MAT 134/135/139/150
- CSC 158S Computer Applications** 2L, 1T:MWF10
 A continuation of CSC 148F. The application of computers to various problems. Elementary numerical methods. Representation and manipulation of graphs. Some techniques of data processing. Construction and validation of computer simulation models. Other non-numerical applications.
Exclusion: CSC 118S
Prerequisite: CSC 148F
- CSC 208S Assembly-Language Programming and Applications** 2L:TR12, 1T:W4
 Introduction to assembly-language programming. Symbolic address mapping, program segmentation and subroutine linking, macro definition and use. Applications.
Exclusion: CSC 258F as given in 1971-72
Prerequisite: CSC 118S/158S
- CSC 218F Introduction to Computer Graphics** 2L:MW12, 1T:F12
 An introduction to graphic display of information and the processing of visual data by computer. Applications in data display, graphic simulation, cartography, digital picture processing, interactive design, computer art, and animation are used to illustrate the various available techniques.
Prerequisite: CSC 118S/158S

- CSC 228S Programming Techniques for Data Processing I** 2L, 1T:MWF12
Decision tables, if-applicable programming, tabling techniques, table oriented logic and debugging, modular programming, modular design, program extendability.
Prerequisite: CSC 158S/(118S and permission of instructor, for 1973-74 only)
- CSC 236S Numerical Methods** 2L:MW1, 1T:F1
Solution of non-linear equations, approximation, quadrature, solution of systems of linear equations, eigenvalues and eigenvectors, differential equations. Exercises requiring the use of a computer will be assigned.
Exclusion: (APM 361F/236S as given before 1972-73)/CSC 351S
Prerequisites: CSC 118S/158S and MAT 134/135/139/150
Note: CSC 118S and MAT 110/130 accepted as prerequisites with MAT 225/224F as co-requisite.
- CSC 248S Programming Languages** 2L, 1T:MWF11
The syntax and semantics of various programming languages, including both algebraic and symbol manipulation languages. Data structures.
Prerequisite: CSC 158S
- CSC 258F Computer Organization** 2L:MW11, 1T:F11
Computer structures, machine languages, instruction execution, addressing techniques, and digital representation of data. Computer system organization, memory storage devices, survey of logic design and micro-programming. Some case studies of actual machines to illustrate various computer architectures.
Prerequisite: CSC 158S
- CSC 334F Programming Techniques for Data Processing II** 2L, 1T:MWF2
Sorting techniques, data structures for data processing, data management systems, information systems, systems analysis, COBOL.
Exclusions: CSC 378F, (458F as given before 1972-73), (238S as given before 1973-74)
Prerequisite: CSC 228S
- CSC 344S Information System Language Design** 2L, 1T:MWF10
Requirements of data manipulation languages. Application oriented language design. Specification of syntax and semantics. Classification of artificial languages. Techniques for the implementation of compilers and interpreters.
Exclusion: CSC 368S
Prerequisites: CSC 258F, 248S, and (334F/(238S as given before 1973-74))
- CSC 348F Introduction to Applied Algebra** 2L:MW11, 1T:F11
A study of the structures of modern algebra with a view to their applications to computer science. Relations, functions, their representations by graphs, matrices and diagrams; semigroups, lattices, Boolean algebras; the minimization problem for Boolean polynomials; the design of sequential networks; universal algebra and its application to modern algebra and automata.
Prerequisite: MAT 224F/140/225
- CSC 351S Numerical Analysis** 2L:MW1, 1T:T4
An introduction to numerical analysis including a study of methods for finding the roots of polynomials and nonlinear equations, solving systems of linear algebraic equations and performing matrix calculations. Approximation theory. Interpolation and quadrature. Numerical solution of ordinary differential equations.
Exclusion: CSC 236S, APM (236S/361F as given before 1972-73)
Prerequisites: CSC 158S, MAT 234/239/250, and MAT 224F/225/140

- CSC 358S Computers and Society** 2L:MW12, 1T:F12
 Growth of computer use (where and why); files, data banks and the right to privacy; surveying, forecasting, system modelling and computer limitations; the impact of automation and technology on employment, and in the political process; technology and values.
Exclusions: CSC 118S, 158S as given in 1970-71
Prerequisites: Any two half-courses in Computer Science, or a thorough familiarity with at least one programming language
- CSC 364S Introduction to the Theory of Computation** 2L:TR2, 1T:W4
 Introduction to formal logic—propositional and predicate calculus. Primitive recursive functions, computable functions, recursive functions, and recursive sets. Turing machines, unsolvable problems. Models, flowcharts, and program schemata; application to equivalence, termination, and correctness of programs.
Exclusion: CSC 438F
Prerequisite: CSC 348F/MAT 345
- CSC 368S Language Processors** 2L:MW10, 1T:F10
 Formal description and classification of programming languages. Specification of syntax. The parsing problem. Top-down and bottom-up parsing. Precedence methods. Attaching semantics to syntax. Translator writing systems.
Reference: McKeeman *et al.* *A Compiler Generator* (Prentice Hall)
Exclusion: CSC 344S
Prerequisite: CSC 378F
- CSC 378F Information Structures** 2L:MW2, 1T:F2
 Data types and operations on them; storage representation and retrieval; access to vectors and matrices; lists, strings and arrays; relations between data; trees; graphs; representations of programs; generalized data structures; data definition facilities in programming languages.
Exclusions: CSC 458F as given before 1972-73, CSC 334F
Prerequisites: CSC 258F and 248S
- CSC 434F Data Management Systems** 2L:TR10, 1T:F1
 Application systems functions and facilities, operating systems support, system structure, software reliability, system security, design and implementation. Data base generation, data base system architecture.
Exclusion: CSC 468F
Prerequisite: CSC 344S
- CSC 438F Computability and Logic** 3S:MWF2
 Turing machines, recursive and primitive recursive functions, Kleene normal form theorem, unsolvable problems, recursively enumerable sets, computational complexity, propositional calculus, predicate calculus including the completeness, compactness, and Lowenheim-Skolem theorems, formal theories.
Exclusion: CSC 364S
Prerequisite: CSC 348F/MAT 340/345
- CSC 441F Advanced Numerical Analysis** 2L:TR11, 1T:W4
 A continuation of CSC 351S, including a study of stability, error analysis, reliability, efficiency and correctness of programs for numerical computation. The development and certification of mathematical software.
Prerequisites: MAT 319S and (CSC 351S/APM 361F as given before 1972-73)

- CSC 444S Economics of Computers** 2L:MW10, 1T:F1
Economics of computing and systems analysis. Case studies of large scale industrial data processing problems.
Exclusion: CSC 328F as given in 1972-73
Prerequisites: CSC (334F/(238S as given before 1973-74)), ECO 241S
- CSC 446S Computational Methods for Partial Differential Equations** 2L:MW10, 1T:F10
Initial value problems. Consistency, convergence, stability. Boundary value problems. Mixed initial-boundary value problems. Difference schemes for nonlinear problems.
Exclusion: CSC 461F & 466S as given before 1972-73
Prerequisite: CSC 351S/(APM 361F as given before 1972-73)
Recommended: APM 351
- CSC 448S Automata Theory** 2L:MW2, 1T:F2
Sequential machines, finite automata and regular sets; generative grammars and languages (context free, context sensitive) and their relation to classes of automata (push down, linear bounded); complexity bounds for recognition, language decision problems, and operations on languages; generalized models of finite automata, and applications to program schemata, compiling, and decidable theories.
Prerequisites: (CSC 368S/344S) and (CSC 438F/364S)
- CSC 468F Operating Systems** 2L:MW11, 1T:F11
Computational structures. Processes and their cooperation; operating systems functions and facilities. Processor allocation; memory management; input-output and files; resource sharing. Correctness and reliability; protection and security. Design methodology; implementation; measurement and evaluation.
Exclusion: CSC 434F
Prerequisite: CSC 378F/458F as given before 1972-73
- CSC 478S Applied Algebra** 2L:MW11, 1T:F11
Groups, rings, fields. Algebraic algorithms, computation with integer and symbolic matrices, interpolation and Chinese remainder algorithms, the fast Fourier transform and multiplication of large integers and polynomials, rational function manipulation. Flow-graph theory with applications to the analysis of graphs, automata, and computer programs.
Prerequisite: CSC 348F/MAT 340/345
- CSC 495Y/496F/497S/498F/499S Advanced Topics in Computer Science** 2L, 1T:Arranged
These are graduate level courses.
Co-requisite: Three other 400-level courses in Computer Science; consent of the instructor and the Undergraduate Secretary of the Department is required.

CZECH AND SLOVAK - See "Slavic Languages and Literatures" (SLA)

EAS

EAST ASIAN STUDIES

Chairman of Department:

Professor W.G.G. Saywell

Undergraduate Secretary:

Professor J.S. Brownlee

Enquiries:

280 Huron Street, Room 421 (928-3301 or 928-3302)

The Department of East Asian Studies offers guidance to students who wish to learn about the great and historic civilizations of China and Japan. The importance of China and of Japan is apparent to the most casual observer of current affairs; but for a proper understanding of Chinese or Japanese values and attitudes it is necessary to study in depth the traditional cultures of these two countries. The courses

offered by the Department fall into two main categories: those which can profitably be taken by students in other disciplines who wish to broaden their horizons; and those which are directed toward intending specialists in Chinese and Japanese studies. Examples of the former are EAS 102, 124, 208, 222F, 224, 226, 280F, 308, 323, 327F, 334, 424S, 425F, JES 126 and JES 333, JMC 300 and JMC 400. These courses encompass a variety of topics in Chinese and Japanese history, literature, philosophy, fine arts, music and theatre. (For courses in other aspects of Chinese and Japanese studies, such as anthropology, sociology, political economy, geography etc., students are referred to the appropriate Departments. Students are also referred to courses offered by the Department of History, the Department of Sanskrit and Indian Studies and the Department of Islamic Studies.)

For specialist study, it is essential to know Chinese or Japanese (students generally concentrate on one or the other), and a full range of courses is given in both languages from the first year onwards, including both the classical and the modern forms. In the junior-level courses, emphasis is placed on the spoken language, using sentence-drill, work in language laboratories, etc.; but students are introduced to Chinese or Japanese script from the first year on, and the senior-level courses are mainly courses in reading. Attention may also be drawn to EAS 290 (a course in Mandarin for Cantonese speakers); and to EAS 324 (a course in written Japanese for specialists in Chinese). Students interested in Chinese or Japanese language should consult the Department for advice in choosing the appropriate course, and refer to the programmes outlined under *Suggested Programmes of Study*: in general, however, specialists should be reasonably sure that they have some aptitude for language before undertaking serious study of Chinese or Japanese. Language courses offered by the Department may also be taken by students of linguistics, and others who need to know Chinese or Japanese for special purposes. Students seeking counselling should first contact the Undergraduate Secretary. In addition all other members of the department freely provide advice and information, and the Undergraduate Secretary may direct students to them.

Specialists in Chinese or Japanese studies most typically continue as Asian specialists during their professional life, whether in university or museum work, in the public service or in business.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- | | | |
|---------|---|--|
| EAS 100 | Introductory Modern Standard Chinese | 4S S1:MTWRF3, S2:MTWRF4,
S3:MW5-7p.m.; S4:MW7.30-9.30p.m. |
| | An introductory course in speaking, reading, and writing Chinese (Mandarin). This course is only open to students with no prior experience in any Chinese dialect, except with special permission. <i>C. Lee</i> . | |
| EAS 102 | History of East Asian Civilization | 2L:TR1, 1T:N |
| | Selected topics to highlight the crucial developments and problems in the histories of China and Japan. Main emphasis is on gradual developments and changes. Provides a background for those who may subsequently wish to proceed further in the study of Chinese and Japanese civilizations. <i>J. Brownlee</i> .
<i>Exclusion: HIS 280</i> | |
| EAS 120 | Introductory Modern Japanese | 5S S1:MTWRF10, S2:MW7.30-9.30p.m. |
| | An introductory course in speaking and writing Japanese. Elementary grammar. Hiragana and basic characters. <i>K. Nakajima</i> . | |
| EAS 124 | Chinese and Japanese Literature in Translation | 2S:T7.30-9.30p.m. |
| | Man and nature; life, love and death through Chinese and Japanese eyes, from earliest times to the present. The Chinese term studies poetry, drama and some fiction. Contact with films, tapes, records and musical instruments is included. The Japanese term surveys the genres, poetry, fiction, diary and pensée, punctuated with illustrative music and art. <i>C. Stevens, K. Richard</i> . | |
| JES 126 | Visual and Performing Arts of East and South Asia
(See JES under "Joint Courses") | |

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- EAS 200 **Intermediate Modern Standard Chinese** 5S S1:MTWRF2, S2:TR7.30-9.30p.m.
A continuation of EAS 100. Further training in speaking, writing, and reading the language. *C. Lee.*
Exclusion: EAS 290
Prerequisite: EAS 100
- EAS 202 **Ancient and Mediaeval Chinese History** 2L:T4-6, 1T:N
A survey of the history of China up to circa 1550.
- EAS 206 **Introductory Literary Chinese** 3S:M9-11, F1
An introductory reading course in Classical Chinese with emphasis on grammar. *A.H.C. Ward.*
Prerequisite: EAS 100
- EAS 208 **Taoist Philosophy** 2S:TR1
Non-action and creativity in the *Tao Te Ching* and the *Chuang Tzu*. *C.D.C. Priestley.*
- EAS 220 **Intermediate Modern Japanese** 4S:TR7.30-9.30p.m.
The course aims to equip students with basic skills for reading modern Japanese prose through careful structure analysis, acquisition of basic working vocabulary and oral drill. *S. Uyenaka.*
Prerequisite: EAS 120
- EAS 222F **Super History of Japan** 2S S1:M4-6, S2:T4-6
Seminars on topics in the political, social, intellectual and religious history of Japan. The general aim is to understand both the construction and maintenance of a revolution-proof society on the edge of the old Asian world, and its fate in the modern international world. *J. Brownlee.*
- EAS 224 **Japanese Poetry and Theatre (in Translation)** 2S:R4-6
Reading and discussion of the major works of Japanese poetry accessible in translation. Discussion of Japanese theatre through the media of films, slides, records and translated texts. *Poetry:* Manyoshu, Kokinshu, Shinkokinshu, haiku of Basho, Buson, Issa and the free verse of modern poets. *Theatre:* No, Kyogen, Bunraku and Kabuki. *K. Richard.*
- EAS 226 **Buddhist Arts of Asia** 2S:TR12
This course considers the various ways in which Buddhism has been important for the visual arts and music of those lands which have adopted it, including India, Tibet, Burma, China, Southeast Asia and Japan. Special attention is paid to methods of study and the problems of cultural analysis. *D.B. Waterhouse.*
- EAS 280F **Chinese Theatre (in Translation)** 2S: T7.30-9.30p.m.
The historical development of Chinese drama, and a study of its basic acting and staging techniques. Films, tapes, slides, and musical instruments are used wherever possible. *C. Stevens.*
- EAS 290 **Chinese for Cantonese-Speakers** 2S S1:T5-7p.m., S2:T7:30-9.30p.m.
Practice in Mandarin pronunciation and traditional Chinese learning materials. Enrolment limited to 20. *C. Lee.*
Exclusion: EAS 100, EAS 200, EAS 332
Prerequisite: Permission of the Department

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- JMC 300 **Modern China in Revolution** 2S:MW12
(See JMC under "Joint Courses")
- EAS 308 **Confucian Philosophy** 2S:T9, R4
The foundations of the Confucian philosophy of human culture, and its development in the Sung Dynasty. *C.D.C. Priestly.*
- EAS 320 **Advanced Modern Japanese** 2S:T7.30-9.30p.m.
Reading and grammatical analysis of texts by modern authors.
Prerequisite: EAS 220.
- EAS 322 **Classical Japanese** 3S:MWF12
Introduction to classical Japanese, followed by reading of various short works by classical authors. *K. Richard.*
Prerequisite: EAS 220
- EAS 323 **Japanese Fiction in Translation** (Not offered 1973-74) 2S
A general survey course, offering a wide selection of reading and discussion topics from both classical and modern Japanese fiction accessible in translation. Individual approaches of students encouraged, concepts from other disciplines welcome. 1st term: Genji, Heike, Court Ladies' Diaries, Mediaeval Buddhist literature etc. 2nd term: Outstanding 20th century writers. *A.V. Liman.*
- EAS 324 **Elementary Modern Written Japanese** 3S:MWF1
An introductory course designed for specialists in Chinese and others who wish to acquire an exclusively reading knowledge of Japanese for research purposes.
Exclusion: EAS 120
- EAS 327F **Personalities in Modern Japanese History** 2S:R4-6
Biographical studies of prominent Japanese people, from the 17th century to the present. The course looks at intellectuals, writers, religious leaders and political figures, to find out what shaped them, how they saw their world, what they tried to do, and whether they liked living. *J. Brownlee.*
- EAS 332 **Advanced Modern Standard Chinese** 3S:M7.30-9.30p.m., W7.30-8.30p.m.
Grammatical and semantic interpretation of modern Chinese texts (2 hours); practice in Chinese conversation (1 hour). *M. Doleželová and C.C. Wang.*
Exclusion: EAS 290
Prerequisite: EAS 200
- JES 333 **Chinese Buddhist Philosophy**
(See JES under "Joint Courses")
- EAS 334 **Chinese Novel** 2S:M4-6
Traditional and modern Chinese novel differ considerably in themes, structures and artistic devices. This course gives a chance to discover the aesthetics of the Chinese novel by historical and structural analysis, based on Chinese texts and/or English translations. Comparative aspect taken into account, wherever possible. *M. Doleželová.*
- EAS 335 **Intermediate Literary Chinese** 3S:N
A continuation of EAS 206. Syllabus flexible. *A.H.C. Ward.*
Prerequisite: EAS 206

COURSES OPEN TO FOURTH-YEAR STUDENTS

- JMC 400 **Nationalism and Social Change in Contemporary China**
(See JMC under "Joint Courses")
- EAS 420 **Classical Japanese Authors** 2S:N
Reading and discussion of selected works in classical Japanese literature. Selection of texts will be made as far as possible to accommodate the interest of participating students.
Prerequisite: EAS 322
- EAS 422F **Tokugawa Intellectual History** 2S:N
Discussion of developments in intellectual history during the period 1600-1868. Neo-Confucianism, *kogaku* and *kokugaku*.
- EAS 423S **Readings in Japanese Intellectual History** 2S:N
Study of texts relating to Japanese thought from early times to Meiji Restoration. Selection of material will be made as far as possible to accommodate the interests of participating students.
Prerequisite: EAS 320
- EAS 424S **Introduction to Japanese Music** 2S:N
The many types of Japanese music, both traditional and modern, are considered historically and comparatively, and are illustrated from the lecturer's own extensive collection of recordings. Musical background and knowledge of Japanese desirable but not essential.
D.B. Waterhouse.
Prerequisite: Permission of the instructor.
- EAS 425F **The Japanese Print** 2S:N
The course centres on first-hand study of the Japanese print collection in the Royal Ontario Museum. Topics discussed include the history of the Japanese print, literature on prints and methods of study and cataloguing. *D.B. Waterhouse.*
Prerequisite: Permission of the instructor.
- EAS 426 **Readings in Modern Japanese Authors** 2S:W7.30-9.30p.m.
Reading of selected works in modern Japanese under the supervision of a staff member. (e.g. Kawabata, Tanizaki, Shiga, Ibuse, Mishima; also examples of critical and journalistic style.)
Prerequisite: EAS 320 or permission of the instructor.
- EAS 428 **Modern Japanese Novelists and the West (in Translation)** 2S:R4-6
Japanese people experienced their first serious confrontation with the West when Commodore Perry's "black ships" sailed into Tokyo Bay in 1853. They have been undergoing a series of cultural shocks from the West ever since. The course is an attempt to examine the theme of East versus West in Akutagawa, Kawabata, Ibuse, Mishima, Abe, Endo and others. *A.V. Liman*
- EAS 430 **The Chinese Novel** (Not offered 1973-74) 3S
Representative selections from: *Shui Hu Chuan*, *San Kuo Chih Yen 1*; *Hung Lou Meng*.
Prerequisite: EAS 332
- EAS 431 **Readings in Modern Chinese Literature** 3S:N
China's fiction, drama, and poetry from 1918 to the present. The choice of works to be read will be made, as far as possible, to accommodate the interests of participating students.
Prerequisite: EAS 332 or permission of the Department.

- EAS 432 **Readings in 19th Century Literary Chinese** 2S:F9-11
A.H.C. Ward.
Prerequisite: EAS 335
- EAS 433 **Chinese Source Materials and Reference Works.** 2S:N
 This course aims at providing students with a basic knowledge of Chinese source materials in all fields, and at developing skills in using the most important reference works. Special attention is given to individual research interests. The course will be particularly useful for students planning to do graduate work. *R.W. Chu.*
Prerequisite: EAS 332
- EAS 435 **Readings in Classic Chinese Prose** 3S:N
 A selection of prose pieces from Han to Ming emphasizing traditional views of excellence. *W. Schlepp*
- EAS 436 **Senior Essay**
 A scholarly project chosen by the student, approved by the department and supervised by one of its instructors.
Prerequisite: Open to Fourth year students only.
- EAS 438 **Advanced Classical Chinese Syntax** 2S:TR10
 Advanced Classical Chinese grammar and syntax. *W.A.C.H. Dobson.*
Prerequisite: EAS 206
- EAS 439 **Introduction to Chinese Classical Historical Texts** 3S:MWF2
 Readings from the *Tso Chuan* and *Shih Chi*. *W.A.C.H. Dobson*
Prerequisite: EAS 206
- EAS 440 **Classical Chinese Poetry** 3S:MWF12
References: Representative selections from the poets of the Mediaeval Period: *Tsao Chih; Pao Chao; T'ao Yuan-ming; Li Po Chu-i; Su Tung Po.* *W.A.C.H. Dobson.*
Prerequisite: EAS 206
- EAS 441 **Introduction to Chinese Poetics** 3S:N
 Includes a review of early phonology and syntax as they bear upon poetic style, a study of metre and the usual poetic devices and finally an examination of usage in several periods. Examples will be taken from verse beginning in Han and going into T'ang. *W. Schlepp*

ECO**ECONOMICS**

Given by the Staff of the Department of Political Economy

See also, COM, POL

Supervisor of Studies: Professor P. Silcox

Enquiries: Sidney Smith Hall, Room 3025 (928-3340)

Economics is a social science; that is, it is an exploration of the behaviour of people in society. Economics studies a particular range of human behaviour that has a strong influence on the structure, well-being, and development of a society.

Much of human activity is directed toward the satisfaction of material wants. In many areas of the world, the greater part of human effort must be directed toward meeting the most elemental demands for food, clothing and shelter. Even in technological-advanced societies, where these basic requirements can be met with comparative ease, the human desire for more goods appears never to be fully satisfied. In consequence, every society—regardless of whether it is capitalist, socialist, or communist in political

orientation—is both competitive and co-operative. It is competitive because its members contend with one another to satisfy their individual wants out of a limited supply of productive resources. It is co-operative because the greatest possible supply of goods is available when the activity of producing them is co-ordinated and organized. The lives of human beings are very largely linked together into societies because of this need for co-operative action.

Economics studies the social problems and issues that arise out of this mixture of competition and co-operation in every society. In recent years, for example, it has been particularly concerned with the diagnosis of two separate phenomena: mass unemployment, and inflationary price increases. It explores the roles of government, of private business, and of individual consumers in relation to these and similar problems. Economics is similarly concerned with the question of growth, from an “underdeveloped” to a materially-advanced society. It asks how this growth comes about, and it asks what new problems arise as new growth is attained. Economics deals with any issue arising out of the conflict between human demand for material goods and a limited supply of resources to satisfy those demands.

Because Economics studies human behaviour, it has links with other disciplines in the social sciences. A student who so desires can join his courses in Economics to courses in Political Science or in History, for example. It is in fact possible to specialize in Political Economy, a combination of Economics and Political Science.

Economic theory now makes considerable use of Mathematics in some of its inquiries. A student who chooses to specialize in Economics should take one basic course in Mathematics (MAT 134 is recommended). If desired, more such courses may be taken; and several Economics courses draw quite heavily on mathematical analysis. However, these courses are optional, offered only for those students whose interests happen to extend along mathematical lines.

Because of the advances in economic theory, an undergraduate degree cannot take the student sufficiently far to make him a professional economist. For this purpose, graduate work is necessary—and one objective of a programme in Economics is to ready those students who want to go on to graduate work in Economics. Graduate work, however, is highly specialized, and the undergraduate programme is not designed solely to feed students into graduate school. Those students thinking of graduate work should seek advice from the Department concerning their choice of courses.

Undergraduate training in Economics, as in other disciplines, is directed toward the goal of a liberal education. Its purpose is to familiarize students with the discipline of economic thinking, and so to equip them for intelligent appraisal of contemporary economic problems. It is intended to make students aware of the nature of economic science, and of the directions in which economic theory is currently moving. It should give students a solid preparation for training in such fields as Law, or for entry into business, industry or government.

The Department publishes a handbook (“The Programme in Economics”) annually during the preregistration period. Copies can be picked up in the Department’s Lounge, Room 3037 Sidney Smith Hall, or at the offices of College Registrars. Counsellors for students in each year are appointed annually by the Department and students are invited to consult them at any time during the session. A list of Counsellors is included in the handbook. The Political Economy Course Union, the students organization for Economics undergraduates, has an office in Room 2034 Sidney Smith Hall.

Students taking the Specialist Programme in Economics should enrol with the Department during September. Other students who intend to concentrate their studies in Economics and who take three or more courses offered in the Department of Political Economy in 1973-74 (whether in Political Science or Economics) should enrol with the Department before November 1st.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- ECO 100 Introduction to Economics** 3L L1:MWF9, MNOL2:MWF10,
OUTL3:MWF11, VL4:MWF12, L5:MWF1, L6:MWF2
- An introductory analysis of contemporary economic institutions and problems: the theory of production and employment; the role of money and the banking system; governmental monetary and fiscal policy; price determination and the role of competition; foreign exchange rates and international trade and finance; and comparative economic systems.
- Exclusion:* ECO 102

- ECO 101 The Economic Development of Modern Europe** 2L, 1T:MWF12
 An historical, empirical analysis of the economic development of modern Europe from the sixteenth century to 1939, with case-studies of the British, Dutch, Belgian, French, German and Russian economies. Beginning with an examination of the changing European economy in the pre-industrial era, and of the major barriers to economic development, the course will then focus upon the institutional and technological causes of growth, with particular reference to the Industrial Revolutions, the role of the state, demographic and social changes. The course will conclude with an analysis of the breakdown of the international economy in the inter-war years. *J.H.A. Munro*
- ECO 102 Introduction to Economics** 3L:MWF11
 An introductory analysis of contemporary economic institutions and problems; the theory of production and employment; the role of money and the banking system; governmental monetary and fiscal policy; price determination and the role of competition; foreign exchange rates and international trade and finance; and comparative economic systems.
Exclusion: ECO 100
Co-requisite: Two of COM 100, 101, MAT 134/130

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

Note: The following courses are also open to First Year students at the discretion of the instructor if space is available and pre- and co-requisites are satisfied.

- ECO 200 Microeconomic Theory** 2L L1:TR10, L2:TR11, L3:TR12, L4:MW1
 A course in the microeconomic theory of pricing. It deals with the determination of prices through the interaction of the basic economic units, the household as consumer and the business firm as producer. Its concern is with the role of the pricing system as the mechanism by which social and individual decisions are made in a capitalist economy.
Exclusion: ECO 241S
Prerequisite: ECO 100/102
- ECO 201 The Economic History of Europe, 300 A.D.-1700 A.D.** 2L:TR3
 The economic "decline" of late Antiquity; the formation and evolution of the medieval European economy and society; and the transition to new modes of economic life in early-modern times. Special attention will be paid to agriculture, industry, trade, money and banking, demography, economic, social, and religious attitudes, government policies, and also their interaction. *A.M. Watson.*
- ECO 202 Macroeconomic Theory and Policy: National Income, Money and Banking** 3L L1:MWF9, L2:MWF10, L3:MWF12, L4:MWF1
 The subject matter of ECO 202 may be subdivided into the following major divisions; macroeconomics, monetary economics, economic stabilization, capital markets and international monetary economics. There is detailed discussion of the theory of output, employment and the price level; of techniques for achieving economic stability; of central banking and Canadian financial institutions and markets; and of foreign exchange markets.
Exclusion: ECO 240F, 204F, 205S
Prerequisite: ECO 100/200
- ECO 220 Quantitative Methods in Economics** 3L:MWF3, 1T:N
 An introduction to the use of statistical analysis, including such topics as elementary probability theory, sampling distributions, tests of hypotheses, estimation and multiple regression analysis. Emphasis is placed on applications in economic and business problems. Elementary calculus and matrix algebra are used. This course is an alternative to STA 232, and only one of the two may be taken for credit.
Exclusion: GGR 270, GLG 221Y, (PSY 200F + 201S), SOC 201, STA 222, 232, 242, 252
Prerequisite: MAT 130/134

- ECO 221 **North American Economic History** 2L:TR12, 1T:N
 This course deals with economic growth and institutional change in Canada and the U.S. The emphasis is upon the application of microeconomic and monetary theory towards an explanation of historical change. A staples approach is taken to the study of Canadian economic history. The cod fisheries and the fur trade are examined for the early period in relation to the economic and political events to which they gave rise. The National Policy is then examined in regard to the creation of transcontinental economy after Confederation.
Prerequisite: ECO 100/102
- ECO 224 **Critical Economic Analysis** 2L:TR2
 This course is concerned with the possibility of selecting an ideal economic system which will adequately use modern scientific knowledge for the benefit of mankind. It is interdisciplinary in content since the economic system is a subsector of a wider social system. Primary emphasis is placed on the adequacy in theory and practice of capitalism and socialism.
Prerequisite: ECO 100/102
- ECO 236 **Canadian Public Finance** 3L:MWF11
 This course is concerned with the economic role and nature of the increasingly important government sector in Canada. The subjects treated will include the growth of the Canadian public sector, the economics of public expenditures, techniques of expenditure analysis and control, the nature and effects of the Canadian tax system, intergovernmental fiscal relations, and the use of fiscal measures to influence the distribution of income and wealth, internal and external stability, and economic growth.
Prerequisite: ECO 100/102
- ECO 240F **Mathematical Approach to Macroeconomic Theory** 2L:TR9
 The theory of national income and price level determination in closed and open economies, including problems of monetary economics, stabilization policy and international economic relations. This course is intended for students with considerable interest and competence in mathematics, and substantial mathematical maturity is assumed.
Exclusion: ECO 202/204F
Prerequisite: MAT 134 (ECO 100 is strongly recommended)
Co-requisites: MAT 225 & 234
- ECO 241S **Mathematical Approach to Microeconomic Theory** 2L:TR9
 The theory of the consumer, the firm, and of general equilibrium of multiple markets; the role of prices as an allocative mechanism. As with ECO 240F, substantial mathematical maturity is assumed of the student.
Exclusion: ECO 200
Prerequisites: MAT 134 (ECO 100 is strongly recommended as preparation.)
Co-requisites: MAT 225 & 234
- ECO 244 **Industrial Relations** 2L:T4-6,1T:N
 This course will cover the following areas; labour movement, its history, structure and philosophy; labour regulations with emphasis on Canadian law; collective bargaining,—nature of the negotiation process, theories of bargaining, the role of conflict, third party intervention, emergency disputes, grievance procedures; the issues in collective bargaining —terms and conditions of employment; collective bargaining and economic formulation.
Exclusion: ECO 344

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

NOTE: The following courses are also open to Second-Year students at the discretion of the instructor if space is available and pre- and co-requisites are satisfied.

- ECO 300 **The Political Economy of Development** 2S:R4-6
 Studies in Comparative Economic History. The approach rests on utilizing past and present experience in development in order to examine decision-making under uncertainty in various situations, the response to uncertainty, and the patterns that emerge from the interaction that uncertainties encounter and the responses to them. It should be emphasized that the approach is exploratory, and that there will be sufficient latitude for the student to concentrate on aspects and areas of most interest to him. *W.T. Easterbrook*
Prerequisite: ECO 202 and permission of instructor
- ECO 301 **European Economic Development, 1750-1914** 2S:T4-6
 This course focusses on national economic development in Great Britain, France, Germany, Russia and Austro-Hungary. While the process of industrialization of these countries will receive considerable attention, the course will also consider the role played in economic development by the agricultural sector, by banking and finance, and by state policies. The issues of poverty and income distribution will be discussed. *S.M. Eddie*
Prerequisite: Permission of the instructor
- ECO 302 **Comparative Economic Institutions in History** (Not offered 1973-74) 2S
 This course attempts to compare various market and non-market types of economic institutions in primitive society, antiquity, and the modern period. Special attention is paid to various ways of organizing the factors of production: land, labour, and capital.
Prerequisite: ECO 100 and permission of the instructor
- ECO 303 **The Age of Mercantilism, 1450-1750 A.D.** 2S:F2-4
 A seminar course combining discussion of directed readings and the presentation of student-selected research topics. The seminar will consider in particular the role of "mercantilist" state policies and practices in the development of national economies in early-modern Europe, up to the Industrial Revolution; but also various other aspects of economic, social, and political change, and their interaction, under such topics as: agriculture, industry, money and banking, trade and transport, overseas colonization, technology, labour, demography, religion, and warfare. *J. Munro*
Prerequisite: Permission of the instructor
- ECO 304F **Economic Development of the Canadian North** 2S:T9-11
 An investigation of the contribution of "the North" to Canadian economic development, combined with a study of how external forces, both market and non-market, influenced the course of development in the North itself. Particular attention is given to the changing role of public policy concerning resource development in the arctic and sub-arctic regions of Canada. *K.J. Rea*
Prerequisite: ECO 100 & 221 and permission of instructor
- ECO 310F **Principles of Industrial Organization** 2L:W4-6
 Beginning with a consideration of the normative properties of perfect competition, this course examines the allocative implications of market failure, the nature of oligopolistic and imperfectly competitive markets, and the implications of non-profit maximizing behaviour by firms. Consideration is given to the measures of industrial concentration and other dimensions of market structure, supporting empirical evidence and models of firm behaviour in different market settings, and selected case studies of particular industries.
Prerequisite: ECO 200/241S
- ECO 311S **Government Policy Towards Business** 2L:W4-6
 The theoretical concepts and tools covered in ECO 310F will be used to evaluate existing government policies affecting the private sector, and to suggest improvements on current policies. Emphasis will be placed on competition and anti-combines policy, the regulated industries, the patent system, externalities and market failure, and the industrial implications of tariff policy. The applicability of current conceptual models to real situations will be discussed.
Prerequisite: ECO 310F

- ECO 312S Public Utility and Public Enterprise Economics** 2L:R9-11
 The sectors where the government directly produces goods and services (public enterprise) and regulates the prices charged (public utilities) are growing in importance. Both theoretical tools and empirical evidence are used to analyze the efficiency and equity aspects of nationalization and regulation.
Prerequisite: ECO 200/241S
- ECO 313S Environmental Economics and Policies** (Not offered 1973-74) 2L
 This course will explore the reasons why pollution problems are not handled satisfactorily by the private sector, and evaluate corrective public policies. The sources of harm, caused by, and control technology for air and water pollution will be reviewed. Current regulatory policies dealing with pollution will be rigorously analyzed and evaluated, and means for improving upon these policies considered.
Prerequisite: ECO 200/241S
- ECO 315 Economic Analysis of Canadian Economic Problems** 2L:W9-11
 A systematic exploration of the uses and limitations of economic analysis for understanding problems of stability, efficiency, growth, and equity in the Canadian economic system. The work of Royal Commissions, of the Economic Council of Canada, and of other organizations concerned with applying economic analysis to policy issues in Canada will be read and critically analyzed.
Prerequisite: ECO 100/102
- ECO 322 History of Economic Thought** 2L:TR10
 After a brief summary account of scholastic and mercantilist economics, the lectures will trace in some detail the development of analytical economics from the eighteenth century with special emphasis upon the work of the Physiocrats; Adam Smith; the British Classical School (particularly T.R. Malthus, David Ricardo, and J.S. Mill); the "marginalists" (particularly W.S. Jevons, C. Menger and L. Waltas) and Marx. Later developments will be examined if time permits. A number of methodological issues are raised, particularly the relationship between economic events and economic theory, and the question of "bias" in economics.
Prerequisite: ECO 200/241S & ECO 202/240F/(204F & 205S)
- ECO 324 Economic Development** 2L:T4-6
 This course is concerned with the economic and social development of the world's underdeveloped countries. It deals with significant characteristics of economic underdevelopment and features of stagnation; and it covers important problems of economic development, including questions of population, capital formation, education, public and private finance, and foreign trade, investment and aid.
Prerequisite: ECO 200/241S & ECO 202/240F/(204F & 205S)
- ECO 325F Advanced Economic Theory - Macro** 2L, ½T:MWF2
 To develop analytical skills in constructing and solving macroeconomic models for handling specific problems. For this purpose weekly problems will be assigned and discussed in the tutorial sessions. The problems and solutions will be based on realistic current policy questions.
Exclusion: ECO 332
Prerequisite: ECO 202/240F/(204F & 205S) and MAT 134
- ECO 326S Advanced Economic Theory - Micro** 2L, 1T:MWF2
 The course focuses on theories and techniques of decision-making by firms and households. It examines the problem of measuring economic welfare, and the merits and shortcomings of the market mechanism in promoting it. Though a basic element of the course is the precise analysis of quantitative relationships.
Exclusion: ECO 332
Prerequisite: ECO 200/241S and MAT 134

- ECO 327 Econometrics** 2L:TR2
 Economics 327 is primarily concerned with developing statistical techniques that can be used in testing economic theory. Special statistical problems arise in estimating economic relationships and the implications and treatment of these problems are the subject matter of ECO 327.
Exclusion: ECO 348, 410
Prerequisite: MAT 234 and STA 232/ECO 220
- ECO 328 International Economics** 2L L1:MW1, L2:TR11
 The purpose of the course is to acquaint students with the operation of the international economy and the economic interdependence among nations, both in terms of international monetary relationships and inter-actions and in terms of trade in real commodities. The course deals with these problems on theoretical, institutional, and descriptive levels.
Prerequisite: ECO 200/241S & ECO 202/240F/(204F & 205S)
- ECO 330 Economy of the USSR** 2L:T4-6
 Analyzes main economic institutions and policy instruments (planning, price policy, fiscal and monetary system), and surveys the most important sectors of the economy (industry, agriculture, labour, transportation, consumption) with special regard for the systemic influences on their operation. Evaluation criteria and major attempts to measure economic performance are studied.
Prerequisite: ECO 200/241S & 202/240F/204F
- ECO 332 Advanced Mathematical Economic Theory** 2L:W9-11
 Dynamic theories of the consumer, the firm, and market adjustment processes. Synthesis of these elements into models of economic growth and of macroeconomic planning. As with Economics 240F and 241S this course is intended for students with considerable interest and competence in mathematics.
Exclusion: ECO 325F, ECO 326S
Prerequisite: ECO 240F and 241S, MAT 225 & 234
Co-requisite: MAT 314F
- ECO 333F Urban Economics** 2L:R4-6
 The purpose of the course is two-fold. To analyse the effects of government policies for regulating private markets in urban areas using such examples as zoning, land speculation, rent control and strategies for pollution control. To evaluate current and proposed methods of providing and financing urban services including discussion of such topics as metropolitan government, pricing of transportation services and the effect of the property tax.
Prerequisite: ECO 200/241S
- ECO 334S Urban and Regional Economics** 2L:R4-6
 This course is concerned with applying economic analysis to urban and regional problems. The following topics will be covered: special aspects of poverty and housing problems in urban areas; theoretical models of urban structure; the interaction between housing, land use, transportation and land rents; tools of regional analysis, and determinants of urban growth and regional development.
Prerequisite: ECO 200/241S
- ECO 335 The Economy of Modern China and Japan** 2S:W4-6
 Following an introductory analysis of the traditional economies of these two nations, the course will focus on post-1949 China and on Japan since Meiji the Restoration as case studies in development economics.
Prerequisite: ECO 200/241S & 202/240F/204F

- ECO 337 Contemporary Issues in the Canadian Economy** 2L:W4-6
 This course will focus on the interrelationship of economics and politics and will consider issues from the viewpoint of conventional economics and radical economics. It will consider the issues of income distribution, corporate behaviour, unemployment, foreign domination, women's liberation, etc.
Prerequisite: ECO 100/102
- ECO 339 The Economics of Labour and Human Resources** 2L, 1T:MWF10
 This course is designed to provide an understanding of the operation of the labour market and the forces which underly it. The course deals with the following topics: population, immigration and labour force participation; labour demand; the functioning of labour markets; wages and wage structure; the economics of unions and their impact on wage structure; employment; unemployment; the relationship between wages, unemployment and prices; education, training and manpower; income maintenance and employment security. Each topic will be approached as follows: theory; experience in Canada and some other countries; public policy.
Exclusions: ECO 339F & 340S
Prerequisite: ECO 200/241S
- ECO 341 Social Choice and Economic Policy** 2L:T4-6
 Starting from economic policy as an institution, the course focuses on the conceptualization of choice and patterns of decision making in this area. Topics include: market and plan; principles and designs of economic policy; normative economics; the logic of decision making.
Prerequisite: ECO 200/241S & 202/240F/204F or permission of the instructor
- ECO 342 Comparative Industrialization** 2L:TR2
 Examines early industrialization in Europe (Britain, France, Germany, Russia), Japan, and certain other countries. Organized topically: Capital accumulation, the banks, generating a labour force, entrepreneurship, the state, foreign trade and exportations. Concludes with a survey of general industrialization schematic—Marx, Schumpeter, Hicks, Gerschenkron, Kindleberger.
Prerequisite: ECO 100/102 & at least one 200-level course in ECO/HIS
- ECO 346F Analysis of Public Expenditures** 2L:M4-6
 Analysis of the economic and redistributive effects of government expenditures. The problem of multiple objectives. Tools for the analysis of government programs: cost-benefit ratios, distributional simulations, and the social rate for discount. A number of policy issues are examined in detail. Other topics explored include the theory of public goods, the determinants of public expenditures in the political process, and problems of fiscal federalism.
Prerequisite: ECO 200/241S & 202/240F/204F
- ECO 347S The Economics of Taxation** 2L:M4-6
 This course will analyze, in some detail, the effect on resource allocation and on the distribution of income, of taxes imposed on and subsidies paid to factors of production and products. Emphasis will be placed on the techniques required for the analysis of these effects with respect to existing taxes and subsidies in Canada, though some attention will be paid to alternative tax subsidy structures.
Prerequisite: ECO 200/241S & 202/204F/240F

COURSES OPEN TO FOURTH-YEAR STUDENTS

- JEP 400 Politics and Economic Development**
 (See JEP under "Joint Courses")

- ECO 410 **Advanced Econometric Theory** 2L:TR2
 This is an advanced course concerned primarily with estimation of parameters and associated problems within the context of stochastic economic models. In addition to a thorough examination of the General Linear Regression Model, considerable time is spent investigating estimation techniques appropriate to simultaneous equation systems.
Exclusion: ECO 327, 348
Prerequisite: MAT 234, STA 232, MAT 140/225, approval of instructor
- ECO 411F **Economics of Transportation** 2L:R9-11
 The course deals with issues in the analysis of transport problems from the public sector point of view. The following topics are treated:
 1) Transportation and the theory of public expenditure;
 2) theory of transport costs;
 3) empirical analysis of transport costs;
 4) transport planning.
Exclusion: ECO 314F
Prerequisite: ECO 200/241S and ECO 220
- ECO 412F **Economics of Poverty** 2L:R4-6
 Economic influences on the extent of inequality and poverty in Canada will be examined. These include aggregate income levels, unemployment, inflation, regional development, education, low wage employment and discrimination. Canadian policies that affect the reduction of poverty are evaluated and proposed programs are critically analyzed.
Prerequisite: ECO 200/241S
- ECO 413S **Economics of Education** 2L:R4-6
 The major problem areas examined include an analysis of the allocative and redistributive effects of the education system and training programs, contribution of education and training to economic growth, relationship of manpower and educational planning, private demand for education, efficiency of educational institutions, and the private and public financing of education and training.
Prerequisite: ECO 200 or equivalent (or the permission of the instructor)
- ECO 420 **Reading Course in an Approved Subject** N
 Open only when a faculty member is willing and available to supervise. Students must obtain the approval of the Supervisor of Undergraduate Studies, before enrolling in this course.
Exclusion: ECO 421F, 422S
- ECO 421F/422S **Reading Course in an Approved Subject** N
 Open only when a faculty member is willing and available to supervise. Students must obtain the approval of the Supervisor of Undergraduate Studies, before enrolling in this course.
Exclusion: ECO 420
- ECO 423 **Senior Seminar in Economics** N
 Open only to students in the Programme in Economics. Students will do a major research paper under the supervision of a member of the staff.

EDUCATION - See INI "Innis College Courses"

EGYPTIAN - See NES "Near Eastern Studies"

Given by Members of the Faculty of Applied Science and Engineering

Chairman of Department: Professor G.R. Slemon

Department Counsellor: Professor A.J. Kravetz

Enquiries: Galbraith Building, Room 152 (928-8666)

The courses offered by the Department of Electrical Engineering provide an opportunity for students in the Faculty of Arts and Science to undertake engineering studies complementary to their main interests. The courses concentrate on two main areas—digital systems and electronics. The former would be of most interest to students intending a career in computer science, while the latter provides excellent support material for those primarily interested in the basic sciences.

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- ELE 350F Physical Electronics I** 2L:TR9, 1½P:R2-5
 The objective of this course is to provide a sound understanding of physical phenomena associated with semiconductor devices. Thermionic emission, contact potential. Semiconductor theory. P-n junctions, Read diode, tunnel diode. Laboratory is given in alternate weeks.
Prerequisite: PHY 230/250 and departmental approval
- ELE 352S Physical Electronics II** 2L:TR12, 1½P:T9-12
 Bipolar transistors. Field effect transistors, MOS transistor. Unijunction transistor. Fundamentals of integrated circuits. Laboratory is given in alternate weeks.
Prerequisite: ELE 350F
- ELE 354S Electronic Circuits II** 3L, 3P:N
 AC coupled transistor stages. DC amplifiers. Integrated circuit design limitation. Multi-transistor circuits from configuration point of view. Hybrid II equivalent circuit models. Audio amplifiers. Wideband amplifiers. Tuned amplifiers. Negative feedback concepts and oscillators. Field effect devices and applications. Transistors as switching elements, simple logic and memory circuits.
Reference: Ghauri, *Electronic Circuits*
Prerequisite: PHY 311/PHY 331F

COURSES OPEN TO FOURTH-YEAR STUDENTS

- ELE 431S Integrated Circuits** 3L, 3P:N
 Design of integrated circuits with particular emphasis on the interaction between device and circuit design. Linear integrated circuit design techniques and limitations. Digital integrated circuits design evolution leading to large scale integration.
Prerequisite: ELE 354S/ELE 452F
- ELE 432S Switching Circuits** 2L, 3P L:TR12, P1:R2-5, P2:T2-5
 Linear wave shaping, switching properties of semiconductor devices, nonlinear wave shaping, switching of logic circuits, bistable, monostable and astable multivibrators. Integrated circuit digital systems including LSI memory systems.
Reference: Strauss, *Wave Generation and Shaping*
Prerequisite: ELE 354S/ELE 452F, departmental approval

- ELE 452F Electronic Circuits III** 2L, 3P:N
 Design of electronic circuits. Multistage amplifiers. Feedback amplifiers. Oscillators. Wideband amplifiers. Tuned amplifiers. Low noise amplifiers. Power amplifiers. Active filters. Distributed RC networks. Elementary analysis of nonlinear electronic circuits. Use of functional electronic building blocks, e.g., operational amplifiers, multipliers, phase locked loops, etc., in instrumentation applications. Computer aided circuit design is used throughout the course.
Reference: Ghauri, *Electronic Circuits*, Millman and Halkis, *Electronic Devices and Circuits*
Prerequisite: ELE 354S/PHY 311 with added effort
- ELE 459F Switching Theory** 2L:TR9, 3P:W9-11
 Combination switching circuits. Minimization techniques. Functional decomposition. Threshold networks. Iterative arrays. Finite state sequential machine model. Synchronous machines. Asynchronous machines. Sequential machine decomposition. Linear sequential machine applications.
Exclusion: ELE 359F
Prerequisite (or Co-requisite): CSC 258F

ENG**ENGLISH**

Chairman of the Combined Departments: Professor F.T. Flahiff (SMC 921-3151)
Secretary of the Combined Departments: Professor D. Duffy (Trinity College 928-3611)
 (until July 1, 1973)

Chairmen of College Departments:

University College: Professor J.J. Carroll (928-3183)
Victoria College: Professor D. Fox (928-3852)
Trinity College: Professor M.T. Wilson (928-2526)
St. Michael's College: Professor D.J. Dooley (921-3151)
Enquiries: Larkin Building, Trinity College, Room 307
 (928-3611)

The study of English attempts to engage the mind, imagination and sensibility of the student in the literature of the English-speaking world, and in related literatures, both classical and modern. The sequence of English literature from its beginnings (about the seventh century) to the present, constitutes a continuous tradition that reflects the vitality of an entire civilization—its political, social, religious, scientific, and cultural life—and, in addition, presents a permanent record of the ways in which the human mind and imagination have responded to recurrent problems and situations. At the same time, each age gives rise to its own peculiar problems. The literature of the past and the literature of our own day can cast light upon the present and indeed upon the future. Literary studies can provide us with a fuller knowledge of ourselves and our world and with deeper insight into the nature of human experience.

The Combined Departments of English offer a large variety of courses in English Literature and the English Language arranged in four series (100, 200, 300, 400). This arrangement denotes the level of mutual expectation in the classroom and is not tied to the year in which a student is enrolled.

The 100- and 200-series courses are, for the most part, introductory courses which have corresponding and more specialized courses in the 300 and 400 series. For example, English 165 is designed to introduce the student to textual criticism while English 467 is an advanced course in the theory and practice of literary criticism. The 100-series courses, open to all students in the Faculty who have not had more than one previous course in English, are designed for anyone seeking a single course in English or introductory courses to the various aspects of the study of literature. The 200-series courses are open to all upper-year students in the Faculty and to first-year students who are also taking a 100-series course. Students in related disciplines such as history, other literatures, music, art or philosophy might consider the 100- and 200-series course as complementing their other interests. For example, English 204 is designed as a survey of mediaeval literature mainly in translation; English 206 is a survey of renaissance literature; English 152 is a survey of Canadian literature.

The 300-series courses are designed for students with some experience in the study of literature and all normally carry the prerequisite of at least one course in English. The 400-series courses all carry the prerequisite of B standing in each of three previous courses in English. These are, for the most part, seminar courses and are designed for advanced students in English or students in other disciplines with a considerable interest in English as a second discipline,

Any student, whether he is intending to specialize in English or not, should consider designing his programme so that his courses support one another. Some students find it valuable to take a course in the history of the same period or country as they are studying in the literature course. For example, renaissance literature courses are broadened and diversified by courses in renaissance history and Canadian literature courses are well matched by courses in Canadian history. Similarly, some students supplement their English courses with courses offered by the Philosophy department in aesthetics or in the influential philosophers in the various historical periods. Other combinations, of course, can be made with other literatures, music, art or the social sciences, depending on the individual interests of each student.

For specialization, the Combined Departments ask for at least ten courses and not more than fifteen courses in English in a four-year degree programme. (For exceptions to this, consult with College Departments.) A student must achieve a B average or better in at least ten courses in English. Nine of the minimum of ten courses are specified in various categories so that, as far as possible, the major writers in English are studied, some work is done in the language, and the student is exposed to the major genres of English literature. A student may then choose his other courses in English (a minimum of one and a maximum of six) to suit his own special interests.

It is important that students understand that the basic programme for specialization in English is *not* conceived primarily as a preparation for graduate school or for Type-A certification for teaching in Ontario. Students who are interested in further degrees should consult their instructors about the requirements demanded by the various graduate schools. Students considering a teaching career in Ontario should consult the Faculty of Education.

As well as a specified number of courses in English, the Combined Departments require that a student intending to specialize take at least five courses in a discipline or disciplines other than English. A knowledge of other disciplines is valuable to a full understanding of the place of English literature among other art forms and social phenomena. Students who think that they might wish to go to graduate school are advised that most schools demand a knowledge of at least one other modern language and/or a classical language; they should seek the advice of their instructors about such requirements.

The programme for students specializing in English and one other subject concentrates on the literature of the British Isles although there is opportunity to take other courses. Students who wish to take such a programme are urged to consult both major departments early in their university career to work out the best possible programme. If such students are contemplating teaching it is very important that they consult the Faculty of Education about the number of courses required for "double certification" and about the admissibility of the second discipline as a "teaching" subject in the province of Ontario.

A departmental brochure may be obtained at the time of publication of this Calendar from College Departments, who can also supply information regarding instructors and the content of courses. Counselling is available from the Secretary, as well as from College Chairmen.

At present no active course union exists within the Combined Departments of English, a body governed by a Council with staff and student membership.

COURSES OPEN TO FIRST- AND SECOND-YEAR STUDENTS AND
TO HIGHER-YEAR STUDENTS WHO HAVE NO MORE THAN
ONE PREVIOUS COURSE IN ENGLISH

ENG 108 **Forms of Twentieth-Century Literature**

3L L1:MWF10, L2:MWF11, L3:MWF12, L4:MWF2, MUVL5:TR11W1

At least twelve and no more than fifteen works by twentieth-century authors, including works by at least three novelists, three poets and three dramatists. These shall include works by at least six of the following authors: Conrad, Faulkner, Joyce, Lawrence, Woolf; Auden, Eliot, Frost, Stevens, Yeats; Albee, Beckett, O'Neill, Pinter, Shaw.

- ENG 112 **Major British Writers** 3L UL1:MWF9, L2:MWF2
 Selections from: Chaucer, Spenser, Shakespeare's non-dramatic poetry, Donne, Milton, Dryden or Pope, Johnson, Wordsworth or Keats, Browning or Tennyson, Yeats or T. S. Eliot. Reference: *The Norton Anthology of English Literature*, one volume ed. (revised). (Alternative or additional texts may be assigned by the instructor.) At least three plays, including one by Shakespeare; Swift, *Gulliver's Travels*; three novels, one from the pre-Victorian, one from the Victorian, and one from the modern period. Additional works may be selected.
- ENG 120 **Varieties of Prose Fiction** (Formerly ENG 220) 3L UMTL1:MWF10, UMVL2:MWF3, TUVL3:TR10W4
 The aim of the course will be to develop an understanding of prose fiction and its techniques through a broad experience of works of different periods and types. Works studied may include short stories, novels, romances and experimental fiction of various kinds.
- ENG 130 **Varieties of Drama** (Formerly ENG 230) 3L L1:MWF9, UVL2:MWF11
 An introduction to drama through the reading and discussion of about twenty-five plays, chosen so as to represent different forms and periods from Classical Greece to the present. Different perspectives on drama—literary, social, theatrical—may be explored.
- ENG 140 **Introduction to Poetry** (Formerly ENG 240) 3L:MWF12
 A study of a variety of poems by poets writing in English selected from different literary periods. The aim will be to develop techniques for the understanding of poetry. Topics will include poetic forms, metaphor and versification, as well as themes and traditions. A comprehensive anthology of poetry is usually the primary text, with other works assigned.
- ENG 150 **American Literature** 3L UMVL1:MWF11, UMVL2:TRF1
 An introductory survey of major works in American literature. At least twelve works will be selected, including at least six written before 1900. The following will be studied early in the course: *Moby-Dick*, *Huckleberry Finn*, *The Scarlet Letter*, and selected poems of Whitman.
- ENG 152 **Canadian Literature in English** 3L L1:MWF10, UMVL2:M1TR12
 An introductory survey of poetry, prose and drama, including works by such authors as: Moodie, Lampman, Haliburton, Grove, Leacock, Pratt, Birney, Callaghan, MacLennan, Lowry, Laurence, Richler, Reaney, Cohen, Atwood. Recommended reading: *The Book of Canadian Prose* (ed. Smith); *Canadian Anthology* (ed. Klinck and Watters, 2nd ed.).
- ENG 165 **English Literature: Forms and Approaches** 3L UMVL1:M1TR12, UMTL2:MWF3
 The course will focus on particular works as representative of various *kinds* of literature (e.g. drama, poetry, novel), as well as on critical approaches that have been developed for gaining a fuller understanding of literary works (e.g. structural analysis, study of imagery, psychoanalytic analysis). Texts: Shakespeare, *Hamlet*; Congreve, *The Way of the World*; selections from the poetry of Marvell and Hopkins; one of More, *Utopia*, Browne, *Religio Medici* or another similar prose work; two of Emily Bronte, *Wuthering Heights*, Faulkner, *The Sound and the Fury* and Forster, *A Passage to India*. At least four more works will be chosen to extend the range of forms and make possible additional approaches. Readings in literary criticism will be assigned.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS AND
TO FIRST-YEAR STUDENTS WHO ARE TAKING AT LEAST ONE
100-SERIES COURSE IN ENGLISH

- ENG 200 **Old English Language and Literature** 3L:MWF2
A study of the language, literature, and culture of the Old English period as represented principally in the surviving poetry. The first half of the course will focus on developing fluency in the reading of Old English, concentrating on the grammar, syntax, and style of various pieces of prose and poetry. The second half of the course will be given over to the intensive study of further major texts in Old English literature.
- ENG 204 **Mediaeval Literature to 1500** 3L:MWF11
A study of some of the major works of mediaeval literature. Boethius, *Consolation of Philosophy*; *Beowulf*; Dante, *Inferno*; *Sir Gawain and the Green Knight*; selections from Chaucer. At least five of the following: *Chanson de Roland*; Chrétien de Troyes; Marie de France; Gottfried von Strassburg; *Roman de la Rose*; *Néjal's Saga*; *Pearl*; *Piers Plowman*; Malory; *Everyman*. Other texts to be selected. Chaucer and later English works will be read in the original.
- ENG 206 **English Literature: More to Milton (Formerly ENG 102)** 3L:MWF3
Poetry: Sidney, Spenser, Shakespeare, Donne, selected poems; Spenser, *The Fairie Queen*, selections. At least three of Jonson, Herrick, Herbert, Marvell, Vaughan, selected poems and Milton, selected minor poetry; Milton, *Paradise Lost*, selections. Drama: Three non-Shakespearean plays. Shakespeare, two plays. Prose: Two or more of More, *Utopia*, Erasmus, *Praise of Folie*, Machiavelli, *The Prince*, Castiglione, *The Courtier* (trans. Hoby), Montaigne, *Essayes* (trans. Florio), Sidney, *An Apology for Poetry*. At least two of Bacon, Donne, Milton, Browne, selected prose. Additional reading may be selected.
- ENG 207 **Nineteenth Century English Literature** 3L UMVL:MWF11
Selected works of at least ten writers illustrating the nature and range of English poetry, fiction and prose in the nineteenth century. At least four authors will be chosen from Scott, Jane Austen, Wordsworth, Coleridge, Byron, Shelley, Keats; and at least four from Carlyle, Newman, Mill, Tennyson, Browning, Thackeray, Dickens, George Eliot, Ruskin, Arnold, Meredith, Hardy. Not more than three novelists will be studied.
- ENG 212 **Shakespeare** 3L L1:MWF12, UMVL2:MWF3, L3:TR11W1
Special study of *Romeo and Juliet*, *A Midsummer Night's Dream*, *Richard II*, *Henry IV*, Parts I and II, *Twelfth Night*, *Measure for Measure*, *Hamlet*, *Antony and Cleopatra*, *The Tempest*. Additions or substitutions may be made by the instructor.
- ENG 218 **Major American Authors** 3L UMVL1:MWF10, L2:TRF1
An intensive study of at least four and no more than six authors. At least three of the authors will be drawn from the following list: Cooper, Emerson, Hawthorne, Melville, Whitman, Twain, James, Eliot, Frost, Hemingway, Stevens, and Faulkner.
- ENG 256 **Canadian Fiction (Formerly ENG 356)** 3L UMVL1:MWF9, L2:TRF1
Selections from an anthology of short stories. A minimum of twenty works including at least one work by eight of the following authors: Haliburton, John Richardson, Moodie, Sara Jeanette Duncan, Leacock, Grove, Callaghan, MacLennan, Lowry, Laurence, Richler. French-Canadian fiction in translation may be included.
Prerequisite: At least one course in English.
- ENG 260 **Varieties of Biography** 3L UL:MWF12
A study of various forms of biographical literature selected from different historical periods. The course may include biographies, autobiographies, letters, essays, journals and memoirs.

- Note: **Special Studies**
 The following "special studies" courses and half-courses numbered 270 etc. are offered for the 1973-74 session only, to students of all colleges, subject to the general regulations of the Combined Departments. Students must enrol with the instructor as well as with their college or faculty, and are advised to do so in the spring preregistration, as enrolment in seminars is limited. College departments reserve the right to withdraw courses. Students are reminded that on the St. George campus all English special studies offerings have the same timetable hours.
- ENG 271 **History of the English Theatre** 1L,2T:TR3, W4
 A study of the conventions and techniques of theatrical production from mediaeval to modern times through examination of dramatic texts from various historical periods. Texts will include mediaeval cycle plays and moralities, Elizabethan works, Restoration heroic dramas, eighteenth-century comedies and tragedies, nineteenth-century melo-dramas, twentieth-century plays calling for various types of stagings. *A. Lancashire* (University College).
- ENG 278 **Film: Aesthetics, Theory, Practice** (Formerly ENG 378) 3L:TR3W4
 The course takes its starting point from literary criticism and will attempt to evolve a film criticism. Various kinds of films will be viewed. Students will be expected to make at least one short film during the course. The course will rely heavily upon a familiarity with the history and principles of literary criticism from Aristotle to Northrop Frye. It is desirable that students have as wide as possible a familiarity with the main genres of English literature throughout history. Various texts will be assigned as reading throughout the course. Maximum enrolment: 25. Instructor: *G. Matteo* (St Michael's College).
- ENG 285S **The Canadian Play in English in the Twentieth Century** (Formerly ENG 385S) 3L:TR3W4
 A study of a minimum of 15 plays, including works by Robertson Davies, James Reaney, George Ryga, and John Coulter. Additional reading will include French-Canadian plays in translation and some radio plays. *A. Saddlemyer* (Victoria College).
- COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS
- ENG 300 **Advanced Studies in Beowulf and Other Old English Poetry** 3L UL:MWF9
Beowulf, ed. Klaeber. Other texts to be selected.
Prerequisite: ENG 200.
- ENG 302 **English Poetry and Prose, 1500-1600** 3L L1:MWF11, UML2:MWF2
 Poetry: Selections from the poetry of Wyatt and Surrey, Sidney, Marlowe, Shakespeare, Spenser (including *The Faerie Queene*, Book I, at least two other Books, and the *Mutabilitie Cantos*) and Donne. Other poets may be added. Prose: More, *Utopia*; Sidney, *Defence of Poesy*. Selections from at least two of the following writers: Elyot, Ascham, Hakluyt, Hooker, Lyly, Sidney (*Arcadia*), Nashe and Deloney. Additional reading from the following: Erasmus, *Praise of Folie*; Castiglione, *The Courtier*; Machiavelli, *The Prince*; Ariosto, *Orlando Furioso*.
Prerequisite: At least one course in English.
- ENG 304 **English Poetry and Prose, 1600-1660** 3L UMTL1:MWF10, UVML2:MWF3
 Selected poetry of Donne, Jonson and their successors; Milton. Prose by such writers as Bacon, Browne, Burton, Milton, Traherne.
Prerequisite: At least one course in English.
- ENG 306 **English Poetry, Prose, and Drama, 1660-1800** 3L UVML1:MWF9, L2:MWF12
 Selections from the works of at least *ten* of the following: Addison, Boswell, Burke, Burns, Butler, Collins, Congreve, Cowper, Defoe, Dryden, Gay, Gibbon, Goldsmith, Gray, Halifax, Johnson, Pepys, Pope, Prior, Rochester, Sheridan, Smart, Steele, Swift, Thomson, Horace Walpole, Wycherley, Young.
Prerequisite: At least one course in English.

- ENG 308 **Romantic Poetry and Prose** 3L UVML1:MWF10, L2:MWF2
 Blake, Wordsworth, Coleridge, Byron, Shelley, Keats for special study; brief selections from other poets of the period such as Crabbe, Scott, Landor, Clare. Wordsworth, *Preface to Lyrical Ballads*, *Preface to the Edition of 1815*; Coleridge, *Biographia Literaria*; Shelley, *Defence of Poetry*; Keats, selected letters; selected writings of Lamb and Hazlitt.
Prerequisite: At least one course in English.
- ENG 312 **Chaucer** 3L L1:MWF11, UVL2:MWF3, VL3:TR11W1
Troilus and Criseyde; selections from the *Canterbury Tales*; further selections from Chaucer's works.
Prerequisite: At least one course in English.
- ENG 322 **Fiction before 1832** 3L:MWF3
 At least twelve works, including one or more by each of Richardson, Fielding, Sterne, Jane Austen and Scott.
Prerequisite: At least one course in English.
- ENG 324 **Fiction, 1832-1900** 3L UVML1:MWF10, L2:MWF2
 At least twelve works, including one or more by each of Dickens, Thackeray, Trollope, Emily Brontë, George Eliot and Hardy.
Prerequisite: At least one course in English.
- ENG 328 **Modern Novel** 3L UVML1:MWF12, L2:MWF3, UTL3:TR2F4
 At least fifteen works chosen from the period c.1900-c.1945, including one or more by each of the following: James, Conrad, Joyce, Lawrence, Faulkner.
Prerequisite: At least one course in English.
- ENG 332 **English Drama to 1642** 3L L1:MWF10, UMTL2:MWF1
 Examples of the miracle play, the morality play, the Tudor interlude, early Tudor and Elizabethan tragedy, comedy and romance; Marlowe: two or more plays; Shakespeare: at least seven of the following: *Love's Labours Lost*, *Richard III*, *Much Ado About Nothing*, *As You Like It*, *Troilus and Cressida*, *Othello*, *Macbeth*, *King Lear*, *Coriolanus*, *The Winter's Tale*; two plays by Jonson, and a selection of works by at least six other Jacobean dramatists.
Prerequisite: At least one course in English.
- ENG 334F **Restoration and Eighteenth-Century Drama** 3L UL:MWF3
Prerequisite: At least one course in English.
- ENG 338 **Modern Drama** 3L UML1:MWF9, UVML2:MWF2, UVL3:TRF1
 A minimum of twenty representative modern plays, including one or more by at least five of the following: Ibsen, Chekhov, Shaw, Synge, Yeats, O'Casey, O'Neill, Eliot, Beckett, Pinter.
Prerequisite: At least one course in English.
- ENG 346 **Victorian Poetry** 3L UVML2:TRF1
 The poetry of Tennyson, Browning, Arnold, for special study: selections from such poets as Fitzgerald, Clough, D.G. Rossetti, C. Rossetti, Morris, Swinburne, Hopkins, Meredith, Hardy, Housman. Selections from the critical writing of Browning, Arnold, Clough, Swinburne, Meredith, Housman, may be added.
Prerequisite: At least one course in English.
- ENG 348 **Modern Poetry** 3L UVL1:MWF10, UMTL2:TR11W1
 Hopkins, Yeats, Pound, Eliot, Stevens; other poets will be added.
Prerequisite: At least one course in English.

- ENG 351 **Topics in American Literature** (Formerly ENG 350 & 352) 3L UL1:MWF2, VL2:TR11W1
A study of one or more special topics in American literature, e.g., thematic, stylistic, or theoretical approaches; genre studies; detailed studies of particular periods or literary movements; the relationships between American writing and American social and intellectual history.
- ENG 354 **Canadian Poetry** 3L:MWF11
A minimum of fifteen poets from the nineteenth and twentieth centuries, at least nine of which to be chosen from the following: Crawford, Carman, Lampman, D.C. Scott, Pratt, F.R. Scott, A.J.M. Smith, Birney, Klein, Livesay, Layton, Avison, Purdy, Souster, Reaney. French-Canadian poetry in translation may be included.
Prerequisite: At least one course in English.
- ENG 367 **History of the English Language** (Formerly ENG 468) 3L UL:TR2
A study of the English language from Old English to the present day. Emphasis will be on specific texts, showing how linguistic techniques can be used in the study of literature. Texts: Robert D. Stevick, *English and its History*, A.G. Rigg, *The English Language: A Historical Reader*.
Prerequisite: At least one course in English.
- ENG 368 **Victorian Prose** 3L UML:TRF1
Selected works from 19th century prose of thought, including at least seven of the following: Carlyle, *Sartor Resartus*, *Past and Present*; Arnold, *Culture and Anarchy*; J.S. Mill, *On Liberty*; Morley; Bagehot, *The English Constitution*; Darwin; Huxley; Ruskin, *Praeterita*, *Nature of Gothic*; Newman, *Apologia*; Butler, Morris, Pater, *Marius the Epicurean*; Wilde.
Prerequisite: At least one course in English.
- ENG 369 **Seminar in Writing** 2L UVL:MW1
Restricted to students who, in the opinion of the Combined Departments of English, show special aptitude for writing. Admission at the discretion of the instructor.
Prerequisite: At least one course in English.
- ENG 390 **Individual Studies**
Students should consult College departments.

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- ENG 404 **Studies in Middle English Language and Literature** 3L UVML:TR11
Prerequisite: Normally B-standing or better in at least three courses in English.
- ENG 413 **Studies in Renaissance Literature** 3L UVML:T9-11
Prerequisite: Normally B-standing or better in at least three courses in English.
- ENG 415 **Studies in Restoration and Eighteenth-Century Literature** 3L UVML1:R9-11
Prerequisite: Normally B-standing or better in at least three courses in English.
- ENG 417 **Studies in Nineteenth-Century Literature** 3L UML1:T9-11, ML2:TR2
Prerequisite: Normally B-standing or better in at least three courses in English.
- ENG 419 **Studies in Twentieth-Century Literature** 3L UVML1:TR1
Prerequisite: Normally B-standing or better in at least three courses in English.

ENG 466 **Comprehensive Examinations** N
 This course will consist of a reading list and three substantial examinations, one each on general literary history, practical and theoretical literary problems and an area of the student's choice.
Prerequisite: Normally B-standing or better in at least three courses in English.

ENG 467 **Seminar in Literary Theory and Practice** 3L:TR12
Prerequisite: Normally B-standing or better in at least three courses in English.

COURSES OPEN TO FOURTH-YEAR STUDENTS

ENG 469 **Senior Essay** 3L:N
 A scholarly project, chosen by the student, approved by the college department, and supervised by one of its instructors.
Prerequisite: Open to fourth-year students only, who have at least B-standing or better in at least three courses in English.

Note: **Special Seminars**
 The following "special seminars" courses are offered for the 1973-74 session only, and are open to students of all colleges, subject to the general regulations of the Combined Departments. Students must register directly with the instructor as well as with their college or faculty and should do so in spring pre-registration, as enrolment in seminars is necessarily limited. College departments reserve the right to withdraw courses. Students are reminded that all English special studies and special seminars offerings on the St. George campus have the same timetable hours.
Prerequisite: Normally B-standing or better in at least three courses in English.

ENG 471 **Play Writing and Play Analysis (Formerly ENG 371)** 3L:TR3W4
 A workshop-seminar for students actively interested in playwriting and problems of dramaturgical analysis. Admission by permission of the instructor, *F.J. Marker* (University College).
Prerequisite: Normally B-standing in at least three courses in English.

ENG 474 **Poetry and Film (Formerly ENG 387)** 3L:N
 The first part of the course is devoted to film appreciation, based on viewing silent classics and documentaries. An attempt is made to develop a critical vocabulary and theory. In the second part of the course, an attempt is made to trace the role of the visual and 'cinematic' element in English poetry as it has developed from Pope through such poets as Wordsworth, Blake and Rossetti to imagist poetry, touching on the work of Eliot and Pound and concrete poetry in the present day. *P. Morgan* (University College)
Prerequisite: Normally B-standing or better in at least three courses in English.

ENG 479 **Ibsen and Strindberg: Major Plays and their Influence in English Theatre** 3L:TR3, W4
 Plays showing the range of Ibsen's and Strindberg's dramaturgy will be read in translation. An attempt will be made to assess their influence in England, paying particular attention to the early plays of Shaw and *The Exiles* by James Joyce. *C. Leland* (St. Michael's College)
Prerequisite: Normally B-standing or better in at least three courses in English

ENG 483 **The Comic (Formerly 383)** 3L:TR3W4
 The course will be concerned with theoretic considerations of comedy as a mode of perception and as dramatic genre; and with studies in the dramatic writings of England's major comic authors, 1660-1790. In addition, selected works by Aristophanes, Shakespeare, Jonson, and Molière will be examined. *G. Falle*. (Trinity College)
Prerequisite: At least one course in English.

ENG 485 Rhetoric: The Poetic and Propaganda of Despair

3L:TR3W4

An introduction to rhetorical theory and criticism through analysis of the 20th Century literature of despair and some historical antecedents. The course will consider (a) classical rhetoric of despair (Spenser, Webster, Swift); (b) the "new rhetoric" (Albee, Beckett, Camus, Eliot, Lawrence, Kafka, Pinter and others), (c) the reductive imitation of literary models in the rhetoric of political movements, film, journalism, and the social sciences.
M. Dixon (University College)

Prerequisite: Normally B-standing or better in at least three courses in English

ETHICS — See PHL "Philosophy"

FACULTY INTERDISCIPLINARY COURSES - See INL "Interdisciplinary Literature Courses" and INX "Interdisciplinary Studies"

FAR**FINE ART**

<i>Chairman of Department:</i>	Professor F.E. Winter
<i>Associate Chairman:</i>	Professor R.P. Welsh
<i>Undergraduate Secretaries:</i>	Professor D.S. Richardson, Miss Marion Walker
<i>Enquiries:</i>	Sidney Smith Hall, Room 6037 (928-3290)

Studies in Fine Art at the University of Toronto attempt to define the rôle of the visual arts in the development of man. Experimental and creative approaches are encouraged, both in art-history and in studio courses. The courses survey all periods from the Bronze Age to the present in the Mediterranean area, Europe and North America. The student may extend his enquiry to the arts of the Islamic and East Asian civilizations in courses given by other Departments. The scope and variety of available courses will prepare the student for the roles of teacher and museum curator, but further professional training is required for both educational and museum work. Because the modern world has become keenly aware of the visual arts as an area of communication, there is, especially in Canada, a need for specialists in these areas.

Generally, the evidence provided by the fine arts enriches the understanding of other disciplines approached by the historical method. The history of art can be related to courses taught in the Department of History. It is one aspect of cultural history examined in the studies of literature in several language departments. To those interested in Music, Fine Art is a sister discipline. A combination of Fine Art courses and Philosophy can improve the grasp of those who are interested in aesthetics. Combinations such as these are encouraged for students in both Fine Art and related disciplines, because they provide sound and valuable background for further studies, particularly at the graduate level.

Attention should be drawn to three points in connection with the course-listings. First, many courses in the Department are offered in alternate years only. Second, for admission to some 300- and 400-level courses a reading knowledge of certain foreign languages is either recommended or required, in addition to the FAR prerequisites indicated. Since the ability to read languages other than English is essential for graduate study, students are strongly urged to include in their first- and second-year programmes such courses as GER 105, 205, and ITA 105 (or 195Z). Third, for students not intending to specialize in Art History, the Department has introduced a series of 200-level half-courses without prerequisites, co-requisites or language requirements.

The Department offers two areas of specialization: History of Art and Studio; it also prepares students for admission to a Type A Certificate offered through the Faculty of Education.

The Department of Fine Art requires no prerequisite at the secondary school level. However, for admission to FAR 110 (Introduction to the Visual Arts) the candidate is required to show evidence of ability in some of the following areas: drawings in two or more materials (charcoal, pencil, pen, brush and other graphic materials); paintings in oil, acrylic, or watercolour; collages, sculpture and three-dimensional design. The portfolio should contain at least ten and not more than fifteen pieces. Three-dimensional work and any other pieces larger than 24" × 36" should be submitted in the form

of slides or photographs; smaller pieces may also be submitted in this form. Presentation of plans for visual projects, unexecuted for lack of facilities, is also acceptable. A written statement giving reasons for wishing to enter Fine Art 110 must accompany the portfolio. Portfolios are required no later than May 1st. Letters will be posted to applicants by May 31st indicating whether they have been granted admission to the course.

Students who intend to undertake graduate study in the History of Art should take the Fine Art-History specialist programme, and should have acquired a fluent reading knowledge of at least one of French, German or Italian by the time they complete the B.A. The Fine Art-Studio specialist programme satisfies the academic requirements of the Faculty of Education for the Type A Certificate. A four-year B.A. programme that includes eight History of Art and five Studio courses meets the course-requirements for both the Type A Certificate and graduate studies in History of Art.

Counselling is available, by appointment, from the Undergraduate Secretaries, the Associate Chairman and the Chairman.

The names of instructors teaching the various courses will be available at registration time in the College Registrars' offices, the Division of Extension, and the Departmental office.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- FAR 100 Materials and Methods of Art History** 2L:TR11
Techniques of describing works of art, and the methods by which the evidence of the works themselves is organized to produce histories of art. Surveys of bibliography and iconography are included.
Co-requisite: FAR 101/102/200
- FAR 101 Ancient Art** 2L:TR1, 1T:N
A survey of the art of Greece and Rome. Emphasis is placed upon the importance of architecture and the arts as characteristic expressions of their age; this concept is illustrated by detailed study of the outstanding monuments.
- FAR 102 Mediaeval Art and Architecture** 2L:TR3, 1T:N
A selective survey of the art and architecture of the Christian world to 1450 A.D.
- FAR 110 Introduction to the Visual Arts** 4P P1:MW2-4, P2:MW4-6, P3:TR9-11, P4:TR11-1
The language of vision is intensively explored through studio work in many media, as well as through discussion of various principles and concepts of form, space and colour. Limited to 20 students per section.
Exclusion: FAR 239F
Prerequisite: Portfolio required by May 1st, 1973. (See essay.)
- FAR 200 European Art from 1400 to 1750** 3L:MWF3
A selective survey of the concepts and problems involved in the transition from Late Mediaeval to Renaissance in Italy and Northern Europe, and of subsequent artistic and cultural developments with special emphasis on the seventeenth century. An acquaintance with contemporary history would be beneficial.
- FAR 255F Greek Sanctuaries**
- FAR 256S Ancient Rome**
- FAR 258S Pompeii, Herculaneum, and Ostia**
- FAR 265F The Mediaeval City**
- FAR 267S The Graphic Arts**
- FAR 271S Architecture in Florence**

FAR 273F **Michelangelo**

FAR 277S **Rembrandt**

FAR 283F **The Birth of Modernism in Painting**

FAR 284S **Dada and Surrealism**

FAR 287F **The Arts in Canada**

(These courses are described in the section which follows.)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- FAR 201 **Western Art Since the Birth of Neo-Classicism** 3L:MWF 2
 A selective survey of art beginning with the second half of the eighteenth century. For painting and sculpture the focus is upon European developments ending with World War II; for architecture North American examples are included as well, and coverage extends to the present.
Exclusion: FAR 283F, FAR 284S
Prerequisite: FAR 200
- FAR 202 **The Bronze Age in the Aegean and Near East** 2L:TR10
 The development of the Bronze Age civilizations of Egypt, Mesopotamia, Crete, and Mycenaean Greece. The material remains revealed by archaeological investigations are discussed as documents of general cultural and historical significance as well as works of art.
- FAR 220 **Later Greek and Roman Architecture** (Not offered 1973-74) 2L
 A detailed study of the transformation of the classical Greek architectural tradition into the Hellenistic style of the Aegean and Western Anatolia, and of the fusion of Hellenistic with Italic elements in Late Republican and Imperial Roman work. Special emphasis is given to the originality of Hellenistic and Roman architects.
Prerequisite: FAR 101
- FAR 230 **Visual Arts II** 6P:MW9-12
 Objective drawing from nature and man-made objects. Conceptual analysis and synthesis of the human form on a two- and three-dimensional level. Surface exploration of colour and design through the use of both new and traditional media. Limited to 20 students per section.
Prerequisite: B standing in FAR 110, or consent of instructor
- FAR 235 **Introduction to Sculpture** 1L, 4P:TR2-5
 Designed to give the serious student a basic understanding and working knowledge of rudimentary principles and practices in plastic presentation. By means of a series of learning pieces the student will engender and control the development of work, from conception through its various phases of growth to the final realization. Limited to 25 students.
Prerequisite: B standing in FAR 100 or consent of instructor.
- FAR 239F **Traditional Studio Techniques** 6P:MW2-5
 A general introductory course in techniques and materials for students with limited skills, but an interest in art history.
Exclusion: FAR 110
Prerequisite: Minimum of three art history courses or approval of instructor

- FAR 255F Greek Sanctuaries** 2L:TR3
A study of major Greek national shrines such as Delphi and Olympia. Emphasis is placed upon the architectural evolution of the sites, the art associated with them, and the religious rites and activities which occurred there.
- FAR 256S Ancient Rome** 2L:TR3
The historical development of the city of Rome from early times to the Late Empire, with emphasis on surviving buildings and monuments and their place in the life of the ancient city. Selected readings in topography, art and architecture, and history.
- FAR 258S Pompeii, Herculaneum, and Ostia** (Not offered 1973-74) 2L
A survey of the public and domestic monuments of three ancient Roman communities, illustrating various aspects of the daily life of the later Republic and the Empire, outside the capital city itself.
- FAR 265F The Mediaeval City** 2L:TR9
A study of town planning, the public architecture of church and state, palaces and private dwellings together with the arts that furnished them.
- FAR 267S The Graphic Arts** 2L:TR9
A history of the medium of print as art in Western tradition from 1400 to the present. Book illustration will be included.
- FAR 271S Architecture in Florence** 2L:TR12
An introduction to the history of Florentine architecture from the eleventh to the nineteenth century.
- FAR 273F Michelangelo** (Not offered 1973-74) 2L
Consideration of his art and thought in view of artistic theory, patronage and the intellectual milieu in which he worked.
- FAR 277S Rembrandt** 2L:MW12
A broad study of the art of Rembrandt van Rijn; his exploration of the human spirit as well as his relation to the economic, social, and religious factors of seventeenth century Dutch culture.
- FAR 283F The Birth of Modernism in Painting** 2L:TR10
An exploration of the emergence in late nineteenth-century Europe of "modernist" or anti-traditional attitudes towards painting.
Exclusion: FAR 201
- FAR 284S Dada and Surrealism** 2L:TR10
An examination of the Dada and Surrealist movements in the plastic arts. While the major emphasis will be on the interrelation of published theories and the artistic production of major Dada and Surrealist painters and sculptors, considerable attention will also be given to artists (e.g. Picasso) who were indirectly affected, and to the problems of psychoanalytic (e.g. Freudian) and political (e.g. Marxist) involvement.
Exclusion: FAR 201
- FAR 287F The Arts in Canada** (Not offered 1973-74) 2L, 1T
A selective survey of all the visual arts (but especially painting and sculpture, architecture and town planning) in Canada from the seventeenth century to the present. Special attention is paid to diverse European traditions shaping the outlook and products of Canadian artists and designers; characteristic patterns arising in the material and social contexts of the New World; parallels in subject, form and idea in other areas; and manifestations of the search for distinctive, Canadian artistic expressions.
Exclusion: FAR 310, FAR 311

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- FAR 305S **Eighteenth Century Stage Design** 2S:TR12
 A study of the major Italian scenic artists of the period. A reading knowledge of Italian is useful.
Prerequisite: FAR 200 or consent of the instructor.
- FAR 307F **Northern European Art under the Impact of Humanism and the Reformation** 2S:TR1
 A study of Albrecht Dürer and his contemporaries, with emphasis on their participation in contemporary intellectual trends as evidenced in their art and writings. An ability to deal with readings in German is highly recommended, as is an acquaintance with the history of the period.
Prerequisite: FAR 200/INV 201 or permission of instructor
- FAR 308 **Netherlandish Art 1550 to 1700** 2L:TR3
 Evolution of the major pictorial media from Pieter Bruegel to Rubens in the Southern Netherlands and to Rembrandt and Vermeer in Holland. A reading knowledge of German is recommended. An acquaintance with contemporary European history would be beneficial.
Prerequisite: FAR 200
- FAR 310 **Painting and Sculpture in Canada and the United States** (Not offered 1973-74) 2L, 1T
 A history of these arts in North America from the late 17th century with special emphasis on their relationship to European traditions, the growth of distinctive national styles, and international interaction.
Exclusion: FAR 287F
Recommended preparation: FAR 200 and/or 201
- FAR 311 **Architecture in Canada and the United States** 2L:TR4, 1T:N
 Architecture in what is now Canada and the United States from the early eighteenth century to the end of the nineteenth century with special emphasis on distinctive types and developments of international significance.
Exclusion: FAR 287F
Recommended preparation: FAR 200 and/or 201
- FAR 316F **Neo-Impressionism and Its Consequences** (Not offered 1973-74) 2S
 A seminar investigation of the birth and development of Neo-Impressionist (Divisionist or "Pointillist") art and theory. Reading knowledge of French required. Normal limit of 15 students.
Prerequisite: FAR 201 or permission of instructor
- FAR 320 **Hellenistic and Roman Sculpture** (Not offered 1973-74) 2L
 The principal works of sculpture from the time of Alexander the Great to the end of the fourth century A.D. will be discussed. Selected pieces in the Royal Ontario Museum will be studied.
- FAR 323 **The Renaissance in Northern Europe** 2L:Eve
 Methods and problems in the study of painting, sculpture, drawings and prints in the Netherlands and Germany from 1400 to 1550. A reading knowledge of German is highly recommended.
Prerequisite: FAR 200 (FAR 102 is recommended as well)
- FAR 324 **Italian Renaissance Architecture** (Not offered 1973-74) 2L
 A study of architecture between 1400 and 1570 and the architectural theories of the time.
Prerequisite: FAR 200

- FAR 325 **Studies in the Art of South German Baroque** 2L:MW1
 An introduction into various aspects of the art of the 17th and 18th centuries with special reference to the *Gesamtkunstwerk*.
Prerequisite: FAR 200
- FAR 326F **David to Daumier** 2S:TR2
 An intensive study of French painting between 1775 and 1850. Reading knowledge of French is expected. Enrolment will normally be limited to 15 students.
Prerequisite: FAR 201 or consent of the instructor
- FAR 329 **English Pre-Gothic Art** 2L:TR4
 The study of a limited number of important works from the Hiberno-Saxon, Anglo-Saxon and Romanesque periods in England.
Prerequisite: FAR 102
- FAR 330 **Intermediate Painting** 6P:TR9-12
 Manipulative skills developed through the study of selected historical techniques and personal development through project work. Limited to 15 students.
Prerequisite: B standing in FAR 230 or consent of instructor
- FAR 332 **Introduction to Printmaking** 1L:W12, 6P:MW9-12
 Introduction to the principles and practice of printmaking. Examination and discussion of major traditional techniques with studio projects chiefly in relief (i.e., woodcut) and intaglio (i.e., etching and engraving) methods. Limited to 15 students.
Prerequisite: B standing in FAR 230
- FAR 333 **Stage Design** 1L:M12, 3P:F2-5
 The history of theatrical design and study of its basic techniques; practical projects in the design of settings and costumes. Enrolment limited.
Prerequisite: FAR 230 or consent of the instructor.
- FAR 335 **Advanced Sculpture** 6P:N
 The course provides further challenges to aesthetic and technical competence for students with a basic understanding of principles and techniques in sculpture. Limited to 20 students.
Prerequisite: B standing in FAR 235 or consent of instructor
- FAR 400S **Le Corbusier** (Not offered 1973-74) 2L
 An intensive study which emphasizes the early, formative years of Le Corbusier in Switzerland, and surveys more briefly his later career in France.
- FAR 402F **Currents in International Art Since 1940** (Not offered 1973-74) 2S
 A seminar investigation of developments in the mainstream of Western painting and sculpture since World War II with special emphasis upon interrelations between Europe and North America. Enrolment is normally restricted to no more than fifteen students.
Prerequisite: FAR 201, FAR 284S or permission of instructor
- FAR 406 **The French Académies and Manufactures, 1571-1793** 2L:MW1
 Evolution of central artistic authority, its theoretical and practical aspects, its major personalities from Baïf's *Académie de Poésie et Musique* to the dissolution of the Academies. Reading knowledge of French required.

- FAR 412S Problems in Modern Architecture** 2S:W4-6
 Special studies in the sources, development and significance of distinctive architectural trends in an area and period to be chosen in consultation with interested students. The area will normally lie within Canada, the United States, or western Europe. The period will normally fall between the early eighteenth and early twentieth centuries.
Recommended preparation: one or more of FAR 200, 201, 287F, 311.
Prerequisite: Consent of instructor
- FAR 420 Hellenistic and Roman Painting** 2L: TR2
 The principal works of painting (including mosaics) from the time of Alexander the Great to the 5th century A.D. will be discussed.
- FAR 422 Decorative Arts of France, England and Canada** 2L:TR10
 A survey of furniture, textile, ceramic and silver design in Europe and North America between the Renaissance and 1850. The collections of the Royal Ontario Museum are used. Limited to 20 students.
Prerequisite: FAR 200
- FAR 430 Advanced Painting** 6P:TR2-5
 Students are encouraged to self-directed studies. The projects can take the form of single or multimedia expressions. Discussions and criticisms will be an important adjunct to this course. Enrolment limited to 15 students.
Prerequisite: B standing in FAR 330; portfolio required
- FAR 432 Printmaking Studio** 6P:MW2-5
 Continued study of the various aspects of traditional and contemporary printmaking with individual projects in relief, intaglio and lithography. Enrolment limited to 15 students.
Prerequisite: B standing in FAR 332
- FAR 435F/436S Independent Projects in Sculpture** 6P:N
 Intended to provide technical advice, criticism and limited supervision to the advanced student in projects of his/her choice. May be taken as either a half-course or a full course.
Prerequisite: Consent of instructor based on evaluation of submitted proposal for projects
- FAR 475F/476S Independent Studies in Art History** N
 Students who have demonstrated unusual ability in earlier years will be encouraged to undertake, under the supervision of one or more staff members, special research projects culminating in a major research paper. Independent Studies may be taken as either a half-course or a full course. Students must obtain the written consent of their faculty supervisor(s) before registering.
Prerequisite: Normally at least six FAR history courses in earlier years, all with B standing

FRE**FRENCH**

Chairman of the Combined Department:

(until 30 June 1973)

(after 1 July 1973)

Secretary of the Combined Department:

Professor P.L. Mathews (928-2463)

Professor E.A. Walker (*Victoria College*)

Professor B.A. Kwant (928-8967)

Chairmen of College Departments:

University College:

Professor P.R. Robert (928-3167)

Victoria College:

Professor D.W. Smith (928-3918)

Trinity College:

Professor B.T. Fitch (928-3278)

St. Michael's College:

Professor R.B. Donovan (921-3151)

Academic Advisers:

<i>University College:</i>	
<i>(until 31 August 1973)</i>	Professor J.A. Fleming (928-4009)
<i>(after 1 September 1973)</i>	Professor P.N. Joliat (928-2109)
<i>Victoria College:</i>	Professor N.J. Swallow (928-3853)
<i>Trinity College:</i>	Professor A.M. Séguinot (928-3039)
<i>St. Michael's College:</i>	Professor R.B. Donovan (921-3151)
<i>New College:</i>	
<i>(until 30 June 1973)</i>	Professor O.J. Miller (928-2636)
<i>(after 1 July 1973)</i>	Professor E.A. Heinemann (928-8968)

French studies in the University of Toronto provide varied and flexible approaches to one of the world's great languages; moreover, French has a position of unique importance in a Canada committed to a confident, practical and creative acceptance of bilingualism. Equipped with a sure knowledge of the language, students will be able to enjoy the riches and intellectual challenge of the literatures of France and French Canada through a wide range of imaginative courses.

The University of Toronto is well aware of the great strides made over the last twenty years in the teaching and learning of French in the secondary schools. Our basic first-year course, FRE 120, assuming satisfactory completion of Grade XIII French, is principally devoted to consolidating the previous experience of students in reading, writing and speaking French. This basic course, conducted entirely in French, as are the great majority of our courses, includes intensive language practice, and much of this involves carefully planned work in the language laboratories serving students of French in all the Colleges. The practical skills thus developed will find a natural outlet in the discussion and essay-writing in French which will be a part of subsequent courses. The basic course is also available in Second Year, or even later to students who are not specializing in French. On the other hand, it may be omitted in whole or in part by specially qualified students who pass a searching test and who may then proceed directly to a more advanced course. Native speakers of French are not permitted to take for credit FRE 120, nor FRE 271. Such students however will be admitted to any courses for which FRE 120 and FRE 271 are prerequisites.

Supplementary to the basic course, two literature courses including French and French-Canadian literature of the twentieth century are open to first-year students. In these courses the student is introduced to the intensive study of vital works of literature and also to the various approaches—historical, biographical, psychological, analytical, structural, sociological, etc.—any of which should be familiar alternative avenues to the appreciation of literature.

Programmes representing specialization in French may be entered in Second Year (although up to two first-year courses may count towards specialization). In the Second Year, the student may choose courses drawn from the following range: (1) the main trends of French and French Canadian literature; (2) various genres—poetry, theatre, the novel, etc.—in various periods; (3) advanced language—phonology, morphology and syntax, stylistics, etc., (4) language practice; and (5) courses of independent study in which the student has a role in defining his field of interest and meets in small tutorial groups for discussion and reading. All of these courses are open to students in higher years. Completion of two second-year courses with high standing may entitle a student to participate in the department's Third Year Study Elsewhere programme.

Third- and fourth-year courses, in most cases interchangeable and open to qualified students, offer further studies in literature from the Middle Ages to our own day and other options in advanced language work, semantics, comparative stylistics, etc. Independent study courses are also provided in each of these years, as well as a series of inter-college seminars allowing greater concentration and study in depth. A course in the French cinema is also offered.

From such a wealth of courses, students of widely differing tastes and needs may select appropriate and enjoyable programmes. Some enthusiastic specialists in French might elect to take the maximum of French courses allowed, but a student will be regarded as a specialist in French upon satisfactory completion of a minimum of ten courses. Details of language, literature and French linguistics requirements may be found in this Calendar under the heading "Suggested Programmes of Study". A specialist student may qualify for entrance to a Type A certificate programme in Français at The College of Education. Many specialists in French may wish to pursue parallel studies in other languages

—Latin, English, German, Italian, Spanish or Russian—thereby qualifying for entrance to a Type A certificate programme in two languages. In this case a minimum of seven courses in French is required. Other specialists will wish to enrich their programme in French with closely related studies in Linguistics, Classics, History, Philosophy, Art, Music, etc. Specialists in other disciplines, perhaps particularly in the social sciences, will frequently find French a natural complement to their programmes. Still others who prefer a broad general programme will have the same wide choice of electives in French following the prerequisite basic course. These combinations are limited only by the student's ingenuity and the time-table.

Students planning to specialize in French are urged to present at least Grade XII Latin, which is necessary for a study of the history of the language and mediaeval literature, and is a requirement for graduate study in French. In lieu of Grade XII Latin or its equivalent, a beginner's course in Latin may be taken as part of the student's programme. Students contemplating graduate work in French are reminded that FRE 316 is required for admission to the Graduate Department, and are advised to consult the Secretary of that Department for information about other requirements.

More detailed information about all the courses listed below may be found in the departmental brochure which is issued early in March and is obtainable from the academic advisers of the College French departments. Students may receive counselling from the academic advisers, who will have a provisional list of instructors for the various courses in time for pre-registration.

The departmental course union represents the students in French at meetings of the Combined Department of French. Members of the course union elect student representatives for all the standing committees of the Combined Department. Each college has a French club which organizes and sponsors a variety of social and theatrical activities.

COURSES NOT REQUIRING GRADE XIII FRENCH

The Department offers a series of three literature courses (FRE 100, 200, 300) for which the prerequisite is an adequate reading knowledge of French as determined by a test. Each of these courses deals with one broad literary topic, (e.g. tragedy, comedy, realism, idealism, etc.) illustrated by the study of French texts drawn from various epochs and genres. Prescribed texts will be read in French. When numbers permit, students may choose lectures and tutorials either in French or in English.

The Department also offers FRE 111, an intensive course in written and spoken French for students with no previous studies in French and for students with some background in French but lacking Grade XIII level. This course meets the prerequisite for FRE 120.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- FRE 100 French Tragic Literature** 1L, 1T:TR9
A study of the tragic mode in selected novels and plays ranging from the 17th to the 20th century. Texts will be chosen from the works of Corneille, Racine, Giraudoux, Anouilh, Bernanos, Malraux, Ionesco, etc. This course may not be counted towards a specialist nor a double specialist programme.
Prerequisite: A reading knowledge of French.
- FRE 111 Intensive French** 3S, 2P UMS1:MWF9, UMS2:MWF12, 2P:N
An intensive course in written and spoken French for students without Grade XIII French or its equivalent. This course may not be counted towards a specialist nor a double specialist programme. Successful completion of this course will, however, meet the prerequisite for FRE 120.
Exclusion: this course is not open to students with Grade XIII French.
- FRE 120 Introduction to University French Studies** 1L, 2T L1:MWF9, L2:MWF10, L3:MWF11, L4:MWF12, L5:MWF2, 2P:N
The major part of this course, designed to facilitate the acquisition of the linguistic skills necessary for active participation in courses offered by the department, is devoted to language practice. However, as well as class and laboratory work in language, attention may also be given to readings and discussions. Not open to native speakers of French.
Prerequisite: Grade XIII FRE/FRE 111

FRE 140 **Studies in Modern French Literature** 1L, 1T:TR10
 Based on a detailed study of specific works selected from the novel, drama and poetry of the 19th and 20th centuries, this course is intended as a practical introduction to the techniques of literary criticism and analysis. Four novels, two plays and four collections of poetry will be selected from the works of Constant, Balzac, Stendhal, Hugo, Musset, Baudelaire, Verlaine, Mallarmé, Alain-Fournier, Apollinaire, Mauriac, Sartre, Camus, Eluard, Char, Anouilh, Ionesco, Butor, etc.

Co-requisite: FRE 120

FRE 142 **Man and Society in French Fiction** 1L, 1T:TR9
 Studies in 20th-century French and French-Canadian fiction with special emphasis on the theme of man in society. Attention will also be given to techniques of literary criticism and analysis. Texts will be selected from the works of Gide, Malraux, Sartre, Camus, Savard, Roy, Langevin, Thériault, Ferron, etc.

Co-requisite: FRE 120

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

FRE 200 **French Comic Literature** 1L, 1T:TR9
 A study of the comic mode in selected novels and plays. Texts will be chosen from the works of Corneille, Molière, Marivaux, Voltaire, Beaumarchais, Jarry, Romain, Aymé, Ionesco, etc. This course may not be counted toward a specialist nor a double specialist programme.

Prerequisite: FRE 100/120

FRE 271 **Language Practice** 3S S1:MWF10, UVMS2:MWF11, S3:MWF2, P:N
 A continuation of FRE 120, this course is designed to further the student's competence in both written and oral French. The programme will include grammar, composition, debate and language laboratory work (corrective phonetics, pattern drills, etc.) FRE 271 is of great value to both specialists and non-specialists. Not open to native speakers of French.

Prerequisite: FRE 120

NOTE: Independent Study. Individual Study with a member of staff on a topic of common interest including readings, discussions and papers.

FRE 290 **Independent Study** N
Exclusion: FRE 291F/S/Y
Prerequisite: FRE 120

FRE 291F/S/Y **Independent Study** N
Exclusion: FRE 290
Prerequisite: FRE 120

FRE 300 **Realism and Idealism in French Literature** 1L, 1T:TR2
 In this course "realism" and "idealism" will be considered as two opposing tendencies in the artist's vision of man's place and existence in the material world. Texts will be chosen from the works of Balzac, Flaubert, Baudelaire, Rimbaud, Zola, Valéry, Gide, Claudel, Giraudoux, Max Jacob, Camus, Robbe-Grillet, etc. This course may not be counted towards a specialist nor a double specialist programme.

Prerequisite: FRE 100/120/200

FRE 320 **The Literature of Classicism**

FRE 322 **The Literature of the Enlightenment**

- FRE 324 **The Literature of Romanticism**
- FRE 326 **Realism in French Literature**
- FRE 330 **The Literature of French Canada to 1959**
- FRE 342 **Studies in French Poetry**
- FRE 352 **Drama from 1600 to 1800**
- FRE 354 **Drama from 1800 to 1950**
- FRE 362 **Prose Fiction from 1600 to 1800**
- FRE 364 **Prose Fiction from 1800 to 1900**
- FRE 366 **Prose Fiction from 1900 to 1950**
- FRE 372 **The Structure of Modern French**
- FRE 373 **General History of the French Language**
- FRE 374 **Introduction of the Stylistics of French**
- FRE 385 **French Cinema**

(These courses are described in the section which follows.)

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- FRE 316 **Mediaeval French Language and Literature** 1L, 1T:TR10
 An introduction to representative literary texts of the Middle Ages in the original from the major genres, with a study of the principal features of Old French phonology, morphology and syntax. FRE 316 is a required course for those entering the Department of French Language and Literature of the School of Graduate Studies.
Prerequisite: any FRE course numbered from 271 upwards
- FRE 318 **French Literature of the Sixteenth Century** 1L, 1T:TR11
 The literature of the Renaissance with a detailed study of major prose writers, Rabelais and Montaigne, and poets Marot, Ronsard, Du Bellay, and D'Aubigné. Some attention may also be given to the development of the theatre.
Prerequisite: any FRE course numbered from 271 upwards
- FRE 320 **The Literature of Classicism** 1L, 1T:TR9
 A study of the major writers of the 17th century with emphasis upon the aesthetic and moral characteristics which constitute "classicism".
Prerequisite: FRE 120
- FRE 322 **The Literature of the Enlightenment** 1L, 1T:MW1
 A study of the revolution in social, political, religious and intellectual values which characterized the literature of the 18th century. Its principal authors—Montesquieu, Voltaire, Diderot, Rousseau—raised issues which neither the Revolution nor the twentieth century has satisfactorily resolved.
Prerequisite: FRE 120
- FRE 324 **The Literature of Romanticism** 1L, 1T:TR1
 A study of French Romantic poetry, novels and plays. This course will also study the origins of the movement and some of its manifestations in European literature, music and art.
Prerequisite: FRE 120

- FRE 326 **Realism in French Literature** 1L, 1T:TR9
 A study of the concept of "realism" in French literature from the Middle Ages to the present day with special emphasis on realistic prose fiction of the 19th century. Specific texts are studied in depth in order to show how given writers seek to convey their sense of reality to the reader.
Prerequisite: FRE 120
- FRE 330 **The Literature of French Canada to 1959** 1L, 1T:TR3
 A study of selected novels, drama and poetry. The texts will be studied from the historical, sociological and aesthetic points of view.
Prerequisite: FRE 120
- FRE 332 **The Literature of French Canada from 1960 to the Present** 1L, 1T:TR2
 A study of selected novels, drama and poetry.
Prerequisite: Any FRE course numbered from 271 upwards.
- FRE 342 **Studies in French Poetry** 1L, 1T:MW1
 A study of selected poems by at least 8 major French poets from the 15th to the 20th century. Emphasis will be placed on the characteristic aspects of French poetry: poetic forms, themes, use of image and symbol, "langage poétique", poetic structure, rather than on historical development.
Prerequisite: FRE 120
- FRE 344 **Modern Poetry (The Post-Romantics)** 1L, 1T:TR9
 A study of major 19th-century post-Romantic poets. Special attention will be given to several of the following: Nerval, Gautier, Leconte de Lisle, Baudelaire, Verlaine, Mallarmé, Rimbaud and Valéry. (Open to second year students with departmental consent.)
Prerequisite: any FRE course numbered from 271 upwards
- FRE 346 **From Symbolism to Surrealism** 1L, 1T:TR1
 A study of Surrealism and its precursors (Lautréamont, Apollinaire, Dada, Breton, Eluard, Aragon); of 20th-century Christian lyricism (Péguy, Claudel) or of some post-surrealist poets (Michaux, Char, Ponge). (Open to second year students with departmental consent.)
Prerequisite: Any FRE course numbered from 271 upwards
- FRE 352 **Drama from 1600 to 1800** 1L, 1T:TR10
 A study of 17th and 18th century drama. This course will examine the "classic" tragedies and brilliant comedies of the 17th century, the new dramatic forms of the 18th century and theory accompanying this later experimentation. Discussion of representative works from both centuries will provide an introduction to the techniques of dramatic criticism.
Prerequisite: FRE 120
- FRE 354 **Drama from 1800 to 1950** 1L, 1T:TR11
 A study of the major plays of the 19th and the first half of the 20th century. This course will provide students with a critical and theoretical approach to the theatre.
Prerequisite: FRE 120
- FRE 362 **Prose Fiction from 1600 to 1800** 1L, 1T:TR1
 A study of the evolution, in the 17th and 18th centuries, of the novel as a literary form and as a social phenomenon, using some of the most representative works of the period.
Prerequisite: FRE 120

- FRE 364 **Prose Fiction from 1800 to 1900** 1L, 1T:TR2
 A study, through the close analysis of specific texts, of the ways in which such major writers as Balzac, Stendhal, Flaubert, Maupassant and Zola developed the techniques of the novel while exploring such varied themes as ambition, alienation and class struggle.
Prerequisite: FRE 120
- FRE 366 **Prose Fiction from 1900 to 1950** 1L, 1T:TR12
 A study of the ways in which 20th-century writers have refined traditional forms of the novel, experimented and innovated, while exploring the diverse spiritual, intellectual, and psychological conflicts of the first half of this century.
Prerequisite: FRE 120
- FRE 368 **Contemporary French Literature** 1L, 1T:TR2
 A study of the novel and theatre since 1950 with special references to the *nouveau roman* and the *anti-théâtre*. This course will examine innovative approaches to the problems of narration and the interpretation of traditional concepts of time, space, and characterization.
Prerequisite: Any FRE course numbered from 271 upwards
- FRE 371 **Language Practice** 3S S1:MWF9, S2:MWF11, S3:MWF2, P:N
 A continuation of FRE 271.
 Further work in written and spoken French, with attention to both literary and informal usage. Laboratory work is included in the course.
Prerequisite: FRE 271
- FRE 372 **The Structure of Modern French** 1L, 1T L1:MW12
 A description of modern French: a study of the phonological, morphological and syntactical systems of the language.
Exclusion: FRE 275/355
Prerequisite: FRE 120
- FRE 373 **General History of the French Language** 1L, 1T:TR11
 The principal aspects of the language of Northern Gaul from earliest to modern times. A general view of phonetic, morphological, syntactical, and semantic evolution; regional, dialectal, and social variations; attitudes of men of letters (writers, grammarians, scholars); political and social history.
- FRE 374 **Introduction to the Stylistics of French** 1L, 1T:TR2
 The study of stylistic aspects of contemporary spoken and written French.
Prerequisite: FRE 120
- FRE 375 **Comparative Stylistics** 1L, 1T:TR3
 A comparative study of expression in English and French from a stylistic point of view; practice in translation.
Prerequisite: FRE 271
- FRE 385 **French Cinema** 1L, 2T ML1:R4-6, TL1:W4-6, MTT1:M4, MTT2:F1
 A study of the French film as a distinct *genre*, including notions of aesthetics, structural analysis and film history.
Exclusion: FRE 485
Prerequisite: FRE 120

NOTE: Independent Study. Individual study with a member of staff on a topic of common interest including readings, discussions and papers.

FRE 390 **Independent Study** N
Prerequisite: Any FRE course numbered from 271 upwards.

FRE 391 F/S/Y **Independent Study** N
Prerequisite: Any FRE course numbered from 271 upwards.

NOTE: INTER-COLLEGE OPTIONS

FRE 425 to 469 are a group of specialized seminars in literary and linguistic studies. Courses will normally be offered only if there is a minimum enrolment of six students at pre-registration. Open to students of all colleges, these courses will normally be limited to a maximum enrolment of twelve students. Priority will be given to Fourth-Year students.

Prerequisite: Any FRE course numbered from 271 upwards

FRE 439 **Dramatic Structures** 2S:N
 A study of the theatre—mainly 20th century—from the point of view of form and structure with particular concern for aesthetic theories and dramatic techniques. Readings from theoretical texts—Brecht, Artaud, etc.—and discussion of notions such as “total involvement”, “distanciation”, and “theatre of cruelty”. *Mme J. Savona (Trinity College)*.
Prerequisite: FRE 354

FRE 441 **Satirical Literature from 1870–1970** 2S
 A study of the characteristics of political and social satire since 1870. The critical approach of French writers to their own customs and institutions will be examined in its various forms: Voltairian irony, destructive burlesque, Rabelaisian raillery, satirical caricature, etc. *J.D. Orsoni (Victoria College)*

FRE 442 **The Realist and Naturalist Novel** 2S:N
 This course will study the two major trends discernible in the French novel of the last half of the 19th century: the beginnings of the realist movement and the development of a “democratic” and anti-romantic literature; and the growth, expansion and decline of literary naturalism. The relationship between the novel and the ideology of the time will be examined, and works of Flaubert, Les Goncourt and Zola will receive particular attention. *J. S. Wood (Victoria College)*.

FRE 443 **Metaphysics and Literary Technique: J.-P. Sartre and S. de Beauvoir** 2S:N
 Traditionally the above authors have been studied as representatives of “littérature engagée”. This course will closely examine their philosophical, critical and literary works from a theoretical and technical point of view while taking into consideration the metaphysical aspects. The theoretical basis of literary analysis will be provided by close reading of modern literary critics. *P. Perron (Victoria College)*.

FRE 444 **The Modern French-Canadian Novel: Style and Structure** 2S:N
 An exploration of the genre with special emphasis on theme, characterization, structure, style and narrative technique. Works studied will include novels by Aquin, Bessette, Blais, Carrier, Ducharme, Ferron, Godbout, Hébert and Jasmin. *M. O'Neill-Karch (St. Michael's College)*
Exclusion: FRE 332

FRE 445 **Introduction to the Art of Translation** 2S
 The course will be practical in nature and will consist of translation from English to French and from French to English. The texts to be translated will be drawn from a variety of sources: literature, economics, politics, science and art. Preference will be given to students who have taken or are taking FRE 374/375. *P.R. Ducretet (University College)*

- FRE 446 **Cinema and Literature** 2S
 A comparative aesthetics of literary and cinematic expression, including aspects of adaptation, narrative structure, dramatic conflict, description, time and memory. Film and literary works studied will include works by the surrealists, Malraux, Sartre, Cocteau, Duras, Robbe-Grillet, Beckett and Ionesco. *D. Clandfield (New College)*
Exclusion: FRE 485
- FRE 447 **French Lexicology and Lexicography** 2S
 The study of the vocabulary of modern French, using socio-linguistic methodology, and the comparison and evaluation of lexical descriptions produced in accordance with this methodology. *T.R. Wooldridge (University College)*
- FRE 448 **Special Seminar** 2S
 Special seminar to be given by a Visiting Professor of French at University College. (Students should consult the brochure published by the Combined Department of French for details.)
- FRE 474 **Advanced Stylistics**
- FRE 476 **French Semantics**

(These courses are described in the section which follows)

COURSES OPEN TO FOURTH-YEAR STUDENTS

NOTE: Fourth-year students are reminded that all Inter-College options and most other courses listed in the two preceding categories may also be taken.

- FRE 471 **Advanced Written and Oral Expression** 2S:TR12
 The writing of French, including various types of composition and text analyses; oral debate. This course is specifically designed to further the student's proficiency in both written and spoken French and to perfect his style.
Prerequisite: FRE 371
- FRE 474 **Advanced Stylistics** 1L, 1T:TR1
 The stylistic analysis of French literary expression.
Prerequisite: Any FRE course numbered from 271 upwards.
- FRE 476 **French Semantics** 1L, 1T:TR12
 A study of the notion of meaning and in particular of French words and their meaning.
Prerequisite: FRE 271 and JAL 100; or FRE 372/373

NOTE: Independent Study. Individual Study with a member of staff on a topic of common interest including readings, discussions and papers.

- FRE 490 **Independent Study** N
Prerequisite: Any FRE course numbered from 271 upwards.
- FRE 491 F/S/Y **Independent Study** N
Prerequisite: Any FRE course numbered from 271 upwards.

Chairman of Combined Department: Professor R.H. Farquharson (928-3923)

Chairmen of College Departments:

University College: Professor H.N. Milnes (928-3184)
Victoria College: Professor G.W. Field (928-3913)
Trinity College: Professor D.A. Joyce (928-2164)
St. Michael's College: Professor W. Hempel (921-3151)

For the past two hundred years Germany, Austria, and German-speaking Switzerland have played increasingly important roles in European life, both as leaders in commerce and industry and as the homelands of important musicians, philosophers, scientists, psychologists, and religious and political thinkers. Their scholars are unrivalled in such fields as Biblical Studies, Mediaeval Studies, Philosophy, Archaeology, Art and Music History, Physics, and Chemistry.

German literature is equally distinguished. Beginning with a vigorous Mediaeval literature and stretching on through Lessing, Goethe, and Heine to Kafka, Thomas Mann, and Brecht, German writers have treated in a provocative and individualistic manner the widest range of human problems, philosophical and psychological, moral and religious, social and economic. University courses in German offer a thorough study of the more important authors from the Middle Ages to modern times.

In each year the Department offers a parallel study of the language including phonetics and laboratory work, oral expression, translation, essay writing, and the history of the language.

Although the Department prefers that students come to the university with Grade XIII German, it recognizes that not all schools offer this course and it has therefore undertaken an Introductory Course in German that will prepare students with no previous knowledge of the language to enter the regular stream of study. Moreover, for departments or faculties that require a student to learn to read scholarly German provision is made for appropriate instruction for beginners and for guidance in reading in specialized fields for those who already have some knowledge of the language.

To consolidate language learning and improve oral fluency the Department co-operates with the German government in sponsoring flights to Germany and summer work for a limited number of undergraduates.

German may be profitably studied in combination with other languages and literatures, with Linguistics, Philosophy, or History. It is offered as an option in such programmes for specialists as English, Music, and Fine Art, and forms itself a part of programmes that specialize in languages and linguistics.

The successful completion of a four-year programme, including seven approved courses in German, entitles a student to do graduate work in the Department. A knowledge of German is also a valuable asset in many other fields, including foreign service. Students who desire information regarding German studies are advised to confer with one of the college chairmen listed above.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

NOTE: Reading lists for the various courses are available from the Department.

GER 100 **Introductory German** 4L, 1P L1:MTWRF1, L2:MTWRF12
 Introduction to the elements of German grammar for students with no previous knowledge of German. Practice in aural comprehension, speaking, reading, and writing. See also GER 106Y, 205, 210.
Exclusion: GER 106Y

GER 106Y **Reading German** (Formerly GER 105) 2L MVL1:TR9, UTL2:TR12
 Training in reading scholarly German for students with little or no previous knowledge of German for whom this work is recommended or required by other departments or faculties. The first course in the sequence GER 106Y-GER 205. The Department reserves the right to place students in the appropriate course in this series.

- GER 110 **Language Practice** 2L,2P:MWF11 + 1hr.N
An intensive course in written and spoken German. Students taking this course and intending to continue in German must take a First Year Literature course as well.
Prerequisite: XIII GER
- GER 120 **Modern German Literature** 2L,1T:MWF9
Selected works of modern German Literature with emphasis on the 20th Century.
Prerequisite: XIII GER
- GER 130 **German Literature of the 19th and 20th Centuries (2hrs):** 2L:MW2
Language Practice (1hr) 1T:F2
A study of works from 19th and 20th Century German Literature to illustrate major trends; practice in active language learning.
Prerequisite: XIII GER
- GER 201 **German Literature in English Translation** 2L:UML1:MW2
Selected works of modern German Literature in English translation. This course is not open to students who are taking German courses for specialization.
- GER 205 **Reading German II** 3S:MWF12
The second course in the sequence GER 105-GER 205. An attempt is made to meet the needs of individual students. The Department reserves the right to place students in the appropriate course in this series.
Prerequisites: GER 105 or XIII GER or GER 106Y

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- GER 210 **Language Practice** 3S:MWF9
An intensive course in written and spoken German at the intermediate level.
Prerequisite: GER 120/130
Co-requisite: GER 220/230
- GER 220 **German Literature of the Enlightenment and Storm and Stress** 2L,1T:MWF10
A study of the works of the German *Aufklärung*, and of the young Goethe, the young Schiller, and their contemporaries.
Prerequisite: GER 120/130
- GER 230 **Nineteenth Century Prose and Poetry (2hrs); Language Practice (1hr)** 2L,1T:MWF11
This course includes major works of such authors as Heine, Stifter, Storm, Fontane, Keller and Raabe. Language work of First Year is continued.
Prerequisite: GER 120/130

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS ONLY

- GER 310 **Language Practice** 3S:MWF9
A full course in intensive language training. Available in either III or IV Year.
- GER 320 **The Age of Goethe and Schiller** 2L,1T:MWF11
Works studied include Faust II, Schiller's mature dramas, and Hölderlin's poems.
- GER 326F **Introduction to Middle High German** 2L, 1T UVML1:MWF2
An introduction to MHG language and literature and to the main aspects of mediaeval culture and civilization through the study of such representative authors as Hartmann von Aue, Walther von der Vogelweide, Wernher der Gartenaere. This course is mandatory for German specialists. This course and GER 327S are required for students intending to take graduate study at the University of Toronto in German.

- GER 327S **Mediaeval German Literature** 2L, 1T UVML:MW2, T:F2
 Reading and literary analysis of a major Middle High German work such as Gottfried's *Tristan*, Wolfram's *Parzival*, or the *Nibelungenlied*.
Prerequisite: GER 326F
- GER 328F **Romanticism Part One** 2L, 1T:MWF10
 A study of the early phase of German Romanticism.
- GER 329S **Romanticism Part Two** 2L, 1T:MWF10
 A study of the late phase of German Romanticism.
- GER 412F **Language Practice** 2L, 1T:TR11, R2
 A half-course in language practice at the advanced level.
Prerequisite: GER 310
- GER 413S **Language Practice** 2L,1T:TR11, R2
 A half-course in language practice and stylistics at the advanced level.
Prerequisite: GER 310/311Y
- GER 415F **The Structures of Modern German** 3L ML:MWF4
 A synoptic description of contemporary Standard German. Concentration on those aspects of the German language which are of specific interest to the advanced language student or the future teacher of German. Offered at St. Michael's College for 1973-74.
- GER 416S **The History of the German Language** 3L ML:MWF4
 The development of the German language from its Indo-European origins to the present, together with the essentials of the cultural background. Special attention to those topics which will help the student to understand the peculiarities of German. Offered at St. Michael's College for 1973-74
- GER 420 **Prose and Poetry; 1885-1945** 2L,1T UVL:MW12, T:F12
 A consideration of significant writers in modern German Literature such as Nietzsche, George, Hofmannsthal, Thomas Mann, Rilke, Hesse, Kafka, Stadler, Heym, Trakl.
- GER 421 **Modern German Drama** 2L,1T UVL:MW3, T:F3
 An examination of the development of this genre from its beginnings in the 19th Century until the present day. This includes such authors as Nestroy, Büchner, Gerhart Hauptmann, Wedekind, Kaiser, Sternheim, Brecht, Peter Weiss, Dürrenmatt.
- GER 423F **Contemporary Literature: 1945 until the Present** 2L,1T UVTL:MW1, T:F1
 A study of post-war trends in German Literature. This will include such authors as Seghers, Nossack, Böll, Celan, Grass, Walser and Kunert.
- GER 424S **Contemporary Literature: 1945 until the Present** 2L,1T UVTL:MW1, T:F1
 Further study of post-war trends in German Literature.

GGR

GEOGRAPHY

<i>Chairman of Department:</i>	Professor D. Kerr
<i>Undergraduate Secretary:</i>	Professor J.N.H. Britton
<i>Enquiries:</i>	Sidney Smith Hall, Room 5052 (928-6455)

The courses offered in Geography cover a wide spectrum but the department's most developed teaching (and research) focus is in urban and regional analysis. Theoretical and applied examinations are made of the uses of urban and non-urban land, the location of economic activities, and the urban and inter-urban movement of information, goods and people. In a few courses historical and cultural approaches are taken to examine these phenomena.

The interaction of man with various aspects of the environment provides the framework for studies in the changing nature of resources, their use, and management. An understanding of a range of current local, regional, and world problems such as the food-population relationship and the preservation of air-water quality is an important focus of several courses.

Physical geography is concerned with the nature of the processes that take place in the earth's subsurface, surface, and atmosphere: the department offers courses in climatology and geomorphology.

In most geography courses there is a Canadian regional emphasis but this is balanced to some extent by foreign area studies that may be undertaken.

The courses of the department may be divided into five groups.

1. Broad first year courses introducing geographical themes and demonstrating integrated approaches to several branches of the discipline.
2. Second year courses open to first year students which present basic knowledge and concepts of more specialized fields (e.g. Introduction to Urban Geography, Principles of Climatology).
3. Regional courses (in second and third year) on Canada, and several other areas.
4. Other courses restricted to second and higher year students because of the previous background required.
5. Fourth year courses providing the opportunity to undertake supervised research and semi-independent study.

Courses are informally organized into sequences in subject strands that fall across the groups described above. Some courses, however, logically fall in more than one sequence while for others, particularly regional courses, a background is best obtained in several sequences.

Some sample sequences are:

	100 series	200 series	300 series
Geomorphology	100	200, 201, 205F	*301, *306F
Environmental Studies	101	222, 233	334F, *335S
Historical	102	248	336F, 348S, 366S, 392F
Urban		210, 224	324F, *337S, 399F
Economic		220	324F, 325S, 326F, 328F
Quantitative		270	*370F, *371S, 372F, 373S, 375S

*GGR 270 or equivalent recommended preparation.

These sequences also allow for the construction of exciting inter-disciplinary programmes; in urban studies, for example, courses in geography, economics and sociology offer a strong basis for confronting many problems of urban growth, regional disparities, and resources management. It is to be noted that much advanced work in geography demands a minimal technical knowledge of analytical methods and appropriate courses are offered to geography students in this field. B.A. and B.Sc. degrees are available.

Geographers work at all levels of government service but particularly in the Federal Departments of the Environment, Energy and Mines, Regional Economic Expansion, and the Department of Urban Affairs. Many graduates of an undergraduate programme in Geography proceed to an M.Sc. degree in Urban and Regional Planning. Graduates in Geography also are employed in marketing firms and consulting agencies concerned with locational problems.

There has been demand for qualified teachers of Geography: a Type A certificate for secondary school teachers requires a four year degree including at least 9 courses in the major field.

A specialist programme in Geography has been developed around a core comprised of analytical, philosophical, and research courses; the core courses are included in order to afford a professional orientation for the programme. This is of particular interest for students who intend to pursue graduate work or analytical or research-oriented careers. Although graduate admission in Geography at the University of Toronto is not contingent on this course of study, it is strongly recommended as preparation for graduate work. A well developed (not necessarily Specialist) programme in Geography and an appropriate level of standing (normally B plus) at graduation usually would allow a student to enrol in the one-year M.A. programme. At the same time students who have done little undergraduate work in Geography may be required to take a two-year M.A. programme, although each case is treated on its individual merits.

Student counselling in geography is provided in four ways: First, Professors A. Baker and K. Hewitt are responsible for liaison with high school students expecting to enrol; the Department provides a rotating panel of undergraduate advisors during the pre-registration periods in March-June as well as during the registration period in early September; the Undergraduate Secretary is available on a continuing basis and students in the Toronto University Geographical Society usually provide a counselling service.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- GGR 100 The Earth's Natural Environments** 2L:TR3, ½T:N
An examination of the major environmental regions of the Earth. Emphasis will be placed on the concept of the natural environment as an interacting system where changes in one part give rise to modifications throughout the whole. This will be examined in various large and small scale regions of the world and the impact of man's actions on the system will be discussed.
- GGR 101 Environment and Man** 2L:MW11 ½T:N
Man and his societies in relation to the geographical environment. His changing perception of that environment, and his systems of responses to it, primarily now and in the future. The climate-soil-biotic complex and its stability in the presence of economic exploitation. Prediction, control and management of environmental factors. Environmental decay and restoration.
- GGR 102 Cultural Contact and Landscape Change** 2L:TR10, ½T:N
This course is organized around two related themes. First, the evolution of traditional agricultural systems and settlement patterns and second, the impact of European expansion overseas as an agent of geographic change.
- GGR 200 Pleistocene Geography** 3L:MWF10
An introduction to glaciology and the causes of glaciation as suggested by theories of climatic change; the evolution of glacial landforms with special reference to Ontario and the Canadian Arctic; chronology of the Pleistocene epoch and regional interpretations; the impact of the Pleistocene on early and modern man. Field and laboratory methods, including field trips.

- GGR 201 **Geomorphology: The Science of Landforms** 3L:MWF12, 1P:N
 An introduction to the principles of geomorphology; sequential evolution of landscapes, classical geomorphology, morphoclimatic and process geomorphology, major features of crustal architecture, physiography of Canada, modern trends and applications of geomorphology. Field and laboratory methods, including field trips and two-hour laboratory sessions every alternate week.
Recommended preparation: GGR 100
- GGR 202 **Principles of Climatology** 2L, ½T:MWF2
Recommended preparation: GGR 100
- GGR 210 **Cities: A Comparative Analysis**
- GGR 220 **Regional Economic Models**
- GGR 224 **Introduction to Urban Geography**
- GGR 240 **Canada - A Geographical Interpretation**
- GGR 250 **Geographical Models of Man**
 (These courses are described in the section which follows.)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- GGR 205F **Pedology** (Not offered 1973-74) 2L, 1T
 Soils in relation to the landscape; important physical and chemical properties of soils; weathering and soil formation; soil mineralogy; soil classification; an outline of the soils of Canada. Three one-day field trips on Saturdays.
Recommended preparation: XII/XII CHM, GLG 100/120 or GGR 100/200/201
- GGR 207S **Airphoto Interpretation** 1L:F11, 2P:T9-11
 An introduction to the application of airphotos as a tool in the study of the rural landscape, including: production and characteristics of airphotos, the technique of stereoscopic photo interpretation, and the principles of the airphoto analysis of landforms, drainage patterns, vegetation and rural land use.
Recommended preparation: GGR 100/200/201
- GGR 210 **Cities: A Comparative Analysis** 2L:TR9, ½T:N
 After a detailed treatment of Toronto as a case study of a North American city, the course examines urban development and the characteristics of cities in Western Europe and the developing countries. Topics include: the medieval city, modern urban forms in Europe, the city in West Africa, South and East Asia and Latin America.
- GGR 220 **Regional Economic Models** 2L:TR11, 1T:N
 An introduction to location, structure and interaction. The course focuses on: the use of location theory in explaining industrial and agricultural patterns; transport networks and flow systems; regional economic development. Examples are drawn from various parts of the world.
- GGR 222 **Introduction to Population Geography** 2L:TR3, ½T:N
 The historical development of world population, theories of population both historical and current, and major issues affecting the current world population situation.

- GGR 224 Introduction to Urban Geography** 2L:TR2, ½T:N
 Urban Systems: urbanization and urban growth; definition, description, and measurement of systems of cities; city size distributions; central place theory. Intra-urban spatial structure: patterns of land use, population density, and land value; social geography; housing; services and industries; transportation. Urban Processes: perception of the urban environment; environmental impacts of pollution, transportation, and growth; development and redevelopment; urban political action in the Canadian context.
- GGR 233 Natural Resource and Environmental Management** 2L:TR12, ½T:N
 An analysis of factors in the management and decision-making process that are leading to the shaping of the environment. Topics include environmental behaviour, assessment of the impact of technology on society and nature, and evaluation of risks and benefits in alternative choices. The course will be future-oriented, concerned with public policy and will adopt a world-view from a Canadian standpoint.
Recommended preparation: GGR 101
- GGR 240 Canada - A Geographical Interpretation** (Not offered 1973-74) 2L, ½T
 An examination of the development of economic regions in Canada. Emphasis will be put on questions of resource endowment, human migration and spatial interaction. Problems of present regional disparities will be discussed.
- GGR 241 Arctic Environment and Resources** 2L, ½T:MWF12
 Information and problem course on Arctic physiography (i.e. geomorphology, biogeography, climate, permafrost and ice conditions), with special emphasis on Arctic Canada. Cultural and historical topics leading to discussion of current and past problems of exploitation vs. development.
Prerequisite or Co-requisite: GGR 100/101/200
- GGR 242 The Geography of Latin America** 2L:MW2, ½T:F2
 This course provides a survey of the settlement geography of Latin America, a discussion of the origin and distribution of the various types of land use in Latin America and a discussion, from the point of view of geography, of some of the major problems of present-day Latin America.
- GGR 245 Geography of Africa** 2L:MW12, ½T:F12
- GGR 248 Historical Geography of Canada** 2L:TR10, ½T:N
 The geography of Canada before Confederation, emphasizing the emerging regional pattern and the relationship between society and human landscape in early Canada.
- GGR 250 Geographical Models of Man** 2L:MW11, ½T:F11
 This course examines the various ways in which man can be represented in relation to place. Basically, this is a "social sciences" introduction to human geography with emphasis on abstraction and precision of concept. The locational arrangement of the social and economic relationships between persons and between person and environment will be studied. The approaches will range through the spectrum from man as a creature of his physical environment, his culture, or his history (and buffeted by chance mechanisms) to wholly rational "economic man" and to normative prescriptions.
- GGR 270 Introductory Analytical Methods** 3L:MWF3
 The course has two parts: descriptive, inferential and spatial statistics; and research design, sampling and computer programming. The objectives of the course are twofold; first, a survey is made of the basic statistical and other quantitative techniques used in geography so that students may effectively read current literature in the field, and second, a necessary technical background is presented for students entering more advanced and analytical courses.
Prerequisite and/or Co-requisite: Two other courses in Geography

- GGR 280 Cartography** (Not offered 1973-74) 1L, 2P
Lectures and workshop introducing principles and methods in the creation and uses of maps as communications media. Topics include: historical perspective, fundamentals of spatial location and scale, map interpretation, cartographic design, statistical procedures, thematic and automated mapping, methods of map reproduction. Enrolment limited to sixty students.

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- GGR 301 Quantitative Geomorphology** 2L:W3-5
Modern developments in geomorphology; geochemistry of weathering; mass-wasting processes, application of soil mechanics to geomorphic analysis; periglacial processes; fluvial geomorphology and river mechanics, including principles of sediment transport mechanics.
Prerequisite: GGR 100, 270 and 390F
Co-requisite: GGR 390F (if not taken previously)
- GGR 304S Bioclimatology** 2L, 1T:MWF9
The survey of modern climatology in relation to plants and animals especially in Northern latitudes. The energy and moisture balances over various natural surfaces will be related to the biotic part of natural ecosystems, to cultivated crops, and to the associated pedogenic processes.
Prerequisite: GGR 100
- GGR 306F Principles of Hydrology** 2L, 1P:MWF12
Properties of the water molecule. Distribution of precipitation. Processes and properties of snow-pack, glacial ice, run-off, ground water, and oceans. Methods of measurement and analysis. Sediment, dissolved solids and water quality.
Recommended preparation: GGR 100, 205F and 270 or consent of instructor
- GGR 307S Land Management** 2L:R3-5
The course deals with past, present and future aspects of rural land utilization. Soil productivity, erosion and conservation; land capability classification; ancient and modern agricultural practices; rural conservation in the face of technological "progress."
Recommended preparation: GGR 101, GGR 205F and GGR 390F (soil capability and agriculture option)
- GGR 311S Sedimentary Processes** 1L, 1P:T4-6
Basic processes of sediment erosion, transportation, and deposition that operate during landscape evolution. Principles of clastic sedimentation, origin of sedimentary particles, particle properties, behaviour of particles in fluids, primary sedimentary structures, sedimentary sequence. Tectonics and sedimentation, geosynclines, continental geomorphology. Modern and ancient depositional environments, environment determination, facies analysis, palaeogeography. Analytic techniques used in sediment studies.
Prerequisite: GGR 301 or permission of instructor
- GGR 320 History and Philosophy of Geography** 2L:R11-1, 1T:T12
A series of lectures in the first half of geographical thought and a series of seminars in the second half on the nature of geography.
Prerequisite: 3 courses in geography
- GGR 323S Principles of Population Analysis** 1L, 1T:M4-6
The geographic analysis of demographic patterns and spatial processes of population change. Particular emphasis is given to the process of population migration and to the vital components of population growth. Stress is placed on concepts, theory and methods of analysis, with practical assignments based on Canadian data.
Recommended preparation: GGR 270 and/or GGR 222

- GGR 324S Geography of Urban and Regional Transportation** 2L:T2-4
 The course provides a broad non-technical overview of some of the major issues in transportation. Emphasis will be placed on spatial and locational aspects of the social consequences of transportation systems in both historical and contemporary contents.
Prerequisite: One of GGR 210, 220, 224, 250 or permission of the instructor
- GGR 325S Spatial and Locational Theory** 2L:F9-11
 A general survey of contemporary spatial and locational theory. Such topics as spatial statistics, regional science theory, diffusion theory, and economic location theory will be examined, and their relation to modern geographic enquiry discussed.
- GGR 326F Industrial Location: Theory, Applications and Policy** 1L,1T:TR3
 Three interrelated sets of ideas are examined in this course. The main contributions to industrial location theory and the use of those ideas as a basis for the analysis of geographic problems (firm or industry) are discussed. Review of the literature of industrial geography, the second objective, centres on the aims, methodology and results of a large body of essentially empirical works. The third facet of the course introduces an applied geographic perspective; overseas and domestic regional planning policies are examined. Students are encouraged to develop an individual research project.
Recommended preparation: GGR 220
- GGR 328F Transportation Systems: Theory and Models** 2L:W4-6
 A survey of some geographical aspects of transportation. Topics include: models of spatial interaction, optimal flow and network generation; descriptors of network structure; travel behaviour, socio-economic impacts of transportation; transportation planning and plan evaluation strategies.
Prerequisite: GGR 370F, an elementary knowledge of calculus and linear algebra or permission of instructor
- GGR 330 Rural Land Use** 2L:MW12, 1T:F12
 This course deals with the use of rural land mainly in economically advanced regions. First term lectures explore theoretical approaches to decision-making and regional patterns in agriculture. The second part of the course is concerned with contemporary problems of land use change, rural development and world food supplies. A field project and another written assignment are integral parts of the course.
Recommended preparation: GGR 101, GGR 220, GGR 270
- GGR 334F Water Resources** 2L:TR2, $\frac{1}{2}$ T:N
 The course will focus primarily on Canadian water resource problems and will deal with such questions as the estimation of national supply and demand, regional and national water transfers, industrial and community supply and disposal problems, the development of Canadian water management strategies, and the implications of the Canada Water Act.
Recommended preparation: GGR 100, 101 or 233
- GGR 335S Seminar in Environmental Management** 2S:W4-6
 A working seminar designed to facilitate the explanation of current literature and research trends by means of student papers, group investigations and experiments, in one or more of the following areas: (a) models of man-environment systems and the use of simulation techniques in understanding resource management decisions (b) environment perception and behaviour and (c) ecological bases for management decisions.
Recommended preparation: GGR 223 and GGR 270
- GGR 336F Urban Geography of North America: Historical Approaches** 1L,1T:R4-6
 Processes of urbanization; development of urban systems; changing internal patterns-central area, transportation, residential; changes in planning.
Recommended preparation: GGR 224/210

- GGR 337S Urban Geography: Implications for Planning and Policy** 1L,1T:R4-6
 A discussion of a selection of current topics in urban geography, and their implications for urban planning and policy, particularly in Ontario and the Toronto area.
Prerequisite: GGR 224 and GGR 270 or consent of instructor
- GGR 338S Cities in Developing Countries** (Not offered 1973-74) 2S
 The course deals both with the changes and problems in the contemporary city in developing countries as well as the historical city outside North America.
Recommended preparation: GGR 210/224
- GGR 340 Europe** 1L:F10, 2T:M9-11
 Lectures deal with selected aspects of Northern Europe and the Common Market countries. Students concentrate on a specific area by means of a reading programme and the writing of a paper.
Recommended preparation: Two courses in Geography
- GGR 343 East Asia** 2L,1T:MWF3
 Lectures and short papers provide a general survey of East Asia during the first term. Research papers and seminars allow students to pursue individual interests during the second. The course emphasizes the changes in spatial distributions and processes that have occurred since the 1850's and includes discussions, from the geographical point of view, of some of the major problems of contemporary East Asia and especially those of China.
Recommended preparation: Two courses in Geography
- GGR 344 The U.S.S.R.** 2L,1T:MWF2
 Topics include: the historical setting, the quality of the Soviet environment, the rural economy, the urbanization process, population migration and problems of regional development, industrial location and resource analysis. Stress is placed on comparisons with North America.
Recommended preparation: Two courses in Geography
- GGR 348S Approaches to Historical Geography** 2S:W4-6
 Seminars on the writings of the more prominent historical geographers from the nineteenth century to the present day. Discussion will focus on the different approaches to historical geography, and on the various attempts to deal with the methodological problems of historical geography.
Prerequisite: GGR 102 or GGR 248 or permission of instructor
- GGR 359F Design & Theory of Spatial & Geographical Structures (Formerly GGR 259F)** 2L:F9-11
 This course will attempt to define fundamental descriptive, normative, and theoretical processes involved in the creation and development of man-made geographies and structures. Emphasis will be on conceptual analysis at a somewhat abstract level, though empirical cases will also be considered. The course will involve a mix of the following elements: 1. Adaptive processes in the design of traditional structures. 2. Nature of design: programmes and definitions. 3. Geographical structures as cultural phenomena. 4. Urban planning theories. 5. Problems in perception and behavioural response. 6. Theories of form structure, and function. 7. Mathematical approaches to the design process. 8. Design of social and economic systems in geographical space. 9. Synthesis: the problem of the ideal human environment.
- GGR 366S Historical Toronto** 2L:R2-4
 The research seminar focusses on the process of Toronto's development as compared to other large North American cities. The emphasis will be on cultural, political and planning processes and on ideological stances.
Prerequisite: GGR 336F

- GGR 370F Matrix Models in Geography** 2L:TR9
 An introductory survey of linear algebraic and matrix modeling approaches to geographic research. Topics include: Markov chains, interregional input-output models, graph theory and linear programming.
Recommended preparation: A previous university course in mathematics is desirable
- GGR 371S Multivariate Statistical Methods in Geography** 2L:T9-11
 Empirical research in Geography requires the consideration of many different variables. This course introduces the problems and procedures of multivariate analysis. Among the topics discussed are discriminant analysis, factor analysis, principle components analysis, and multiple regression. Each student will apply these procedures to his own data deck and evaluate the results.
Recommended preparation: GGR 270 and GGR 370F
- GGR 372F Methods of Describing Spatial Distributions** 2L:N
Recommended preparation: A previous university course in mathematics or permission of instructor
- GGR 373S Models for Generating Spatial Distributions** 2L:N
Prerequisite: GGR 372F or permission of instructor
- GGR 375S Combinatorial Processes and Geographical Structure** 2L:M4-6
 Ways are considered in which geographical systems can be decomposed into their elemental parts and analyzed as combinatorial structures. Particular attention is paid to the use of this process in planning, especially of transportation and locational systems. In addition, applications are considered in architectural design, taxonomy and electoral districting. All mathematics and computational processes relevant to the course are dealt with, starting at the most elementary level. This course may be seen as laying some of the more rigorous foundations of general structuralist theory, though with a strongly normative bias.
- GGR 390F Field Methods in Physical Geography** 2L:W9-11
 The course includes a one-week field camp in September, an assignment to be completed during the preceding summer in preparation for the camp, and supplementary practical work during the fall term. The cost of the field camp to the student, including board and transportation, is about seventy dollars.
Prerequisite: GGR 100 and GGR 270
- GGR 391F Field Methods and Research Design in Economic and Social Geography** 2L:W9-11
 Research design in social and behavioural science, with emphasis on geographical problems. Topics covered include: sampling design, interviewing, questionnaires, unobtrusive measures, participant observation, documentary sources, and criteria for research design. Students will be involved in field research projects.
Prerequisite: GGR 270, GGR 220/224/250
- GGR 392F Evidence and Techniques in Historical Geography** 2L:W4-6
 The course consists of a critical appraisal of the data sources available to the historical geographer and an examination of the ways in which these may be utilized. Emphasis will be placed on the use of Canadian sources, but the relevance of techniques and approaches to studies elsewhere will be illustrated. A field trip will familiarize students with areas and issues upon which particular seminars will focus.
Prerequisite: GGR 102 or GGR 248 or permission of instructor

GGR 399F Advanced Urban Analysis

2S:R9-11

This is a research seminar focussed on problems in social, political, economic and transport geography.

Prerequisite: Permission of Instructor

COURSES OPEN TO FOURTH-YEAR STUDENTS

GGR 491 Research Project

N

Each student must register for this course with the Undergraduate Secretary by April 6, 1973 and indicate at that time the field of geography in which he wishes to pursue research. It is expected that each student will begin work (including field investigations where relevant) during the summer so prior consultation with his supervisor is necessary. A list of supervisors and groups of students will be available at the Undergraduate Office at the end of April and it is intended that there be preliminary meetings in May-June. A student should select 300-series courses in his programme to provide an appropriate background to his research interest.

Prerequisite and/or co-requisite: Eight courses in Geography including the core courses in the specialist programme (i.e. GGR 270, 320/320F/321S and 390/391F/392F)

GGR 496F/497S Advanced Reading in Geography

Students may undertake independent study in Geography under the direction of a faculty member. Persons wishing to take this course must have the consent of the Undergraduate Secretary in this Department and of the prospective supervisor.

GGR 498F/499S Advanced Topics in Geography

Graduate level courses in philosophy of geography, climatology, geomorphology and urban, economic, environmental, cultural/historical, quantitative geography. Consent of the instructor and the Undergraduate Secretary of the Department is required.

GLG**GEOLOGY**

Chairman of Department:
Enquiries and Student Counselling:

Professor D.W. Strangway
Mining Building, Room 119 (928-3021)

Geology is the principal branch of the solid earth sciences concerned with the origin, history and structure of the Earth. It is a scientific discipline providing a dynamic perspective view of the physical, chemical and biological processes that have operated on the earth by observations of rock materials representing a time continuum.

Geology has provided insight into such diverse phenomena as continental drift, economic mineral deposits, the origin and evolution of life and the history of ocean basins. A new development is environmental geology that seeks to relate resources distribution and management to mankind's growing requirements. Geology has many practical applications ranging from oil and mineral exploration to civil engineering, urban development and the evaluation of natural hazards such as earthquakes, landslides and volcanic activity. Geology is intimately linked with investigation of water and energy resources, critical commodities for civilization. A perspective view of the environmental crisis facing life on this planet is obtained by studying the ecology of fossil populations that have faced similar crises in the past.

For many years, geology was an observational science providing an understanding of the character and distribution of rocks. Modern geology combines field and laboratory studies with experimental and theoretical considerations of chemical, physical and biological systems of crustal materials. Thus geology can be divided, for example, into the general fields of geochemistry, geophysics and paleobiology to indicate the principal systems investigated. Alternatively, the organization and method of study breaks down geology into more specific disciplines such as stratigraphy, petrology, structural geology, paleobotany, invertebrate paleontology, rock analysis, mineralogy, paleoecology, economic geology, and geologic data handling.

Geologists are scientists who investigate the structure, composition, distribution and inter-relationships of materials forming the crust of the earth. Careers in geology are mainly in the mineral resources industries for exploration and development of metal deposits, energy resources, fossil fuels, water and industrial minerals, in research sponsored by government and industry to seek new knowledge for understanding earth evolution; in government agencies concerned with geological mapping both in Canada and other countries, as well as the oceans and perhaps in the near future the moon; in technical and engineering work such as rock analysis, mine and oil field development, mineral and fossil identification, and geological engineering; in teaching in secondary schools and universities; and in curation and display in museums. In aggregate, most geologists are employed in research and development capacities by oil and mining companies and federal and provincial surveys. Opportunities for travel for professional geologists are excellent. Professional geologists have to specialize in geology at the undergraduate level. Industry and government often employ students during the summer months who are majoring in geology. Graduate programmes of study can lead to research careers in government and industry and to University appointments.

Students who intend to become professional geologists should plan their programme carefully along the lines suggested elsewhere in this Calendar (see "B.Sc. Programmes"). Normally, GLG 120 and GLG 220 must be completed before the end of the second year because these are basic prerequisites for third and fourth year geology courses (GLG 100 may substitute for GLG 120 as a prerequisite generally if a satisfactory mark is obtained). Combinations of other courses in mathematics, biology, chemistry, physics and computer science form a necessary background for geology. The suggested programme leads to certification as a specialist in geology but students should consult with counsellors regarding possible substitutions in this recommended programme.

The choice for third and fourth year geology programmes is large and their precise composition will depend on the background and interests of individual students. By the end of the fourth year, the specialist student should have completed at least $9\frac{1}{2}$ courses in geology and at least $5\frac{1}{2}$ courses in other sciences and mathematics. Several programmes reflecting different specializations within geology are possible. Students are urged to consult the staff for further information and details and to make use of the counselling service available (see names at head of this section) before making final decisions. Geophysics is taught in the Department of Physics and students interested in this aspect of earth science should consult the courses offered by that Department both for content and prerequisites. The names of lecturers and laboratory instructors for each course will be posted in the department as soon as possible.

Students who desire a general background in geology should choose from the selection of first year courses with due regard to prerequisites for second year courses if any of these are to be taken subsequently. Because of the multi-disciplinary nature of geology, it interfaces with several other fields such as chemistry, biology, physics, geography, economics, anthropology and engineering. Courses in geology form a valuable ancillary for students specializing in these other fields.

Students interested in environmental problems should also refer to courses listed in the Inter-disciplinary Courses section of the Calendar (INX).

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- GLG 100 **Introduction to Geology** 2L,2 $\frac{1}{2}$ P:M6:30-10.00 p.m.
A survey of geology emphasizing chemical and physical processes of the past and present: physical geology in the first term; historical geology in the second term; crystals, minerals, rocks, structure, maps, fossils and evolution in the laboratory periods. Offered in evenings only.
Exclusion: GLG 120
- GLG 102 **Mineral Resources and Related Environmental Problems** 2L:TR12
The management of world mineral resources. The origin, distribution, consumption and probable remaining supply of important mineral resources such as nickel, salt, water, petroleum, uranium and gravel will be described as a basis for discussing economic, technological and environmental factors that govern their recovery and use. This material should enable the student to contribute more intelligently to solution in the political forum, of problems associated with an industrial society.

GLG 120 Principles in Geology 2L, 1T, 2P L:MW12, T:F12, P1:M2-4, P2:T9-11, P3:F1-3
 A two-part lecture-laboratory course that examines principles of physical and historical geology and the evolution of the earth as a planet. Part I deals with the origin of the earth and the physical processes that operate on and in it. Part II traces the history of the earth and its changing environments from the sequence of physical and biological events revealed in the rock record with emphasis on paleontology and the concepts of geologic time. A field trip accompanies the work of each term.

Exclusion: GLG 100

Prerequisite: XIII MAT Functions and Relations and Calculus and XIII BIO/CHM/PHY

GLG 121F The Geological Record of Evolution 2L:TR11
 An overview of the evolution of invertebrate, vertebrate, and plant life in relation to time, space and environment.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

GLG 220 Mineralogy 2L:TR4, 4P:R9-1
 A first course in mineralogy and crystallography; the study of minerals as inorganic chemicals in the earth's crust; the principles of crystal chemistry and its use in mineralogy; the relationship between structures and physical properties of minerals; the use of the polarizing microscope; the theory and practice of optical mineralogy; the occurrence and classification of minerals and their identification both micro- and macroscopically.

Prerequisite: CHM 120

Prerequisite or co-requisite: GLG 120 (GLG 100 by permission of the Department)

GLG 221S Geological Data Processing by Computer 1L:T11, 3P:W9-12
 Applied mathematics, probability and statistics for processing geological data using computer methods. (May not be combined with GGR 270/STA 232/STA 242/STA 252/ECO 220/POL 206/(PSY 200F & PSY 201S)/SOC 201 in any degree programme.)

Prerequisite: CSC 148F/CSC 108F/Y

Prerequisite or co-requisite: GLG 120 (GLG 100 by permission of the Department)

GLG 222 Invertebrate Macropaleontology 1L, 3P L:M4, P1:T9-12, P2:F9-12
 Study of paleoenvironment, geosynclinal development, tectonics and continental drift through the evolution and life crises of selected marine invertebrate groups.

Prerequisite: GLG 120 (GLG 100 by permission of the Department)

GLG 227 Global Geology 2L, 2P
 Geological and geophysical data will be used to examine relations between present day ocean basins, oceanic ridges, volcanic island arcs and stable continents. The nature of the crust, mantle and core and the major distinctions between them will be discussed with particular reference to their role in governing surface features of the earth. The Plate Tectonic theory and its relevance in North America, the Arctic and Tethys will be reviewed in terms of the regional geology and of selected geophysical information. Laboratory work will concentrate on the interpretation of regional geology and of geophysical data and on examination of suites of specimens illustrating various geological environments.

Prerequisite: GLG 120

Co-requisite: GLG 220 and GLG 222 strongly recommended

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

GLG 320 Petrology I 2L, 3P L1:MW1, P1:F9-12, P2:R2-5
 The principles of petrology; the classification, description and interpretation of the sedimentary, igneous and metamorphic rocks. Microscopic petrography.

Prerequisite: GLG 220

- GLG 321F Stratigraphy and Sedimentation** 1L:F1, 3P:W9-12
 A course devoted to the study of the properties and classification of sediments and strata. Sedimentary environments and tectono-environmental concepts in stratigraphy; the influence of global tectonics on local stratigraphy.
Prerequisite: GLG 220, 222, or permission of instructor
Co-requisite: GLG 320
- GLG 322 Tectonics** 1L:W4, 3P:R9-12
 Geometry of existing deformational structures in the earth's crust and reconstruction of their mechanical development.
Prerequisite: GLG 220
Co-requisite: GLG 321F
- GLG 323Y Mineralogy II** 2L:TR1
 Crystal chemistry, structural crystallography and crystal field theory applied to the major mineral groups.
Prerequisite: GLG 220
- GLG 324 Physical Geochemistry I** 3L:MWF3
 Chemical thermodynamics, phase diagrams, electrochemistry, solution chemistry and ionic equilibria, kinetics with examples from natural and experimental mineral systems at a wide range of temperatures and pressures.
Prerequisite: GLG 220
- GLG 325F Field Camp I**
 A field course in the northern Appalachians emphasizing elementary mapping methods and basic field techniques applicable to structural-stratigraphic studies. The Taconian orogenic belt in Quebec and the adjacent craton will be examined in the field as a prelude to more intensive study and laboratory work in 300-series courses. This eight day field camp is offered as a half course and is required of all students wishing to graduate as having completed the specialist programme in geology. A fee, currently \$40, is charged to cover part of cost of transportation and accommodation. Additional readings and reports are completed during the summer following the field course.
Prerequisite: GLG 120, GLG 122
- GLG 327S Geology of the Canadian Shield** 1L:F1, 3P:W9-12
 The stratigraphy, tectonic divisions and economic aspects of the Precambrian. Laboratory study of geological maps and reports; examination of typical rock suites in hand specimens and thin sections.
Prerequisite: GLG 321F
Co-requisite: GLG 322
- GLG 328 Micropaleontology and Palynology** 2L:TR1, 3P:T2-5
 A course on the evolution of selected groups of plant and animal microfossils and their use in stratigraphy. The paleoecologic and distributional significance of palynomorphs on a local to world-wide basis is investigated in the laboratory and as seminar topics.
Prerequisite: GLG 222
- GLG 370Y X-ray Crystallography** (Not offered 1973-74) 2P
 Elementary X-ray diffraction methods and their use in geological studies.
Prerequisite: CHM 120
- GLG 371Y Environmental Geochemical Analysis** 4P:M9-1
 Laboratory and field investigation of modern methods and equipment used for analyzing natural materials. This course is project oriented allowing each student to study a problem of his own choosing.
Prerequisite: CHM 120

- GLG 372Y **Mineral Identification Laboratory** 2P:T11-1
 A continuation of the laboratory work in mineralogy of GLG 220.
Prerequisite: GLG 220

COURSES OPEN TO FOURTH-YEAR STUDENTS

- GLG 420 **Petrology II** 2L:TR9, 3P:M2-5
 The petrogenesis of igneous and metamorphic rocks.
Prerequisite: GLG 320, 323Y, 324
- GLG 421 **Mineral Deposits** 2L:TR11, 3P:W2-5
 Systematic mineralogy and phase equilibria of ore minerals. Identification of ore minerals in polished section. Geochemistry of ore-forming processes. Description of important ore deposits and discussion of their genesis.
Prerequisite: GLG 320, 324
- GLG 423 **Physical Geochemistry II** 2L:TR10
 Application of geochemical knowledge to problems of petrogenesis and ore genesis.
Prerequisite: GLG 320, 324
- GLG 424 **Environmental Interpretation** 2L:TR12, 2P:M9-11
 Environmental interpretation with special emphasis on limestone associations. Faunal succession and correlation. Practical applications.
Prerequisite: GLG 321F and permission of instructor
- GLG 425F **Field Camp II**
 A two-week field camp held following the conclusion of the annual Third Year examinations. Instruction and experience in geological mapping. This half-course is required for all students wishing to complete the specialist programme in geology. A fee, currently \$80, is charged to cover part of the costs of meals and accommodation.
Prerequisite: GLG 320, GLG 322
- GLG 426 **Advanced Vertebrate Paleontology** 1L:F1, 3P:R2-5
 A professionally-oriented course covering literature, illustrations, manuscripts, techniques of preparation, preservation, replication, photography, radiography, record-keeping and cataloguing. Lectures stress history, current problems, general anatomical and paleontological principles and practices, ancillary techniques such as geochronology, elementary surveying and oral and visual presentation.
Prerequisite: ZOO 464
- GLG 427F **Structural Petrology** 2L:TR1, 2P:W9-11
 Structures and textures of igneous, sedimentary and metamorphic rocks. Methods of quantitative analysis of grain fabrics.
Prerequisite: GLG 220 and 322
- GLG 428 **Petroleum and Groundwater Geology** 2L:MW1, 3P:T2-5
 Occurrence of oil and gas in sedimentary basins and the geological conditions that govern their entrapment; ground water and its relation to the geology of drainage basins; fluid flow through porous media.
Prerequisite: GLG 321F and 322
- GLG 430 **Paleocology** 2L:TR9, 2P:M2-4
 A lecture and laboratory course in paleocology and ecology of marine algae, terrestrial microfossils, and marine invertebrate sea-shells, autecology, synecology, communal hierarchy, environmental parameters, numerical analysis.
Prerequisite: GLG 321F, GLG 328

- GLG 470 **Laboratory Research** N
 Laboratory Research stressing methods and experimental techniques applicable in geology. Students must obtain the consent of instructor before enrolling in this course, and generally, obtain an average of at least 75% in the work of the Third Year. Students are expected to spend approximately 10 hours per week in the laboratory.
Exclusion: PHY 421Y
- GLG 490 **Approved Graduate Course** N
 Any geology course listed in the graduate calendar. Generally, students must obtain an average of at least 80% in the work of the Third Year.
Prerequisite: Approval by the Department of Geology.
- GLG 496 **Special Topics in Geology** N
 The Department may make available under this title special full or half-courses on topics not normally offered. The number of students applying for a topic will be taken into account.

GLL GREEK AND LATIN LITERATURE IN TRANSLATION

Given by the Intercollegiate Department of Classics

See also GRK, GRH, LAT

Students should refer to the essay published under "Classics"

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- GLL 150 **Intellect and Imagination in the Greek World** 2L, 1T:MWF12
 The Mycenaean and Homeric worlds and their expression in art and literature, with reference to the *Iliad* of Homer. Fifth and fourth century Athens, with reference to the drama, moral and political philosophy, art and architecture, with detailed reading of representative texts.
- GLL 190 **Greek and Roman Religion and Mythology** 2L, 1T ML:MW11, T:F11
 A study of the myths and legends of the Greeks and Romans; illustrated by slides and films. Tutorials will provide a deeper insight into various aspects of the growth and development of religious ideas and rituals in the Graeco-Roman world.
- GLL 200 **Greek Tragedy and Comedy** 2L,1T UL1:MWF2, TL2:MWF10
 A survey of Greek drama from the origins of tragedy in the sixth century to New Comedy, with close study of selected plays of Aeschylus, Sophocles, Euripides, Aristophanes, and Menander, and attention to Aristotle's *Poetics*.
- GLL 202S **The Ancient Novel** 1L:F1, 1T:N
 The development in Greece and Rome of an imaginative prose literature, which anticipates the modern European novel. Greek romances present young love and sensational adventure in an idealized setting. Petronius' *Satyricon* shows the culture of Nero's Italy through the eyes of a homosexual trio, and Apuleius' *Golden Ass* recounts the experiences of a young man in Greece transformed into an ass. The *True History* of Lucian, a parody of travellers' tales, is an amusing forerunner of science fiction.
- GLL 206F **Socrates** 2L, 1T ML:TR11, 1T:N
 An examination of a critical moment in Greek intellectual and political life, as seen from various points of view. Topics include: the nature of Socrates' activity, the political background of his trial, the religious and social questions involved, and types of Socratic Literature. Plato's *Euthyphro*, *Apology* and *Crito*, Aristophanes' *Clouds*, and selections from other authors (especially Xenophon) will be read.

GLL 210 **Roman Literature and Society** 2L:TR10, 1T:N
 Roman literature from its beginnings in the third century B.C. to the end of the second century A.D. A history of ideas and their literary expression in an evolving social structure, based on the study of selected texts from Roman comedy, Lucretius' philosophical poem, *On the Nature of Things*, Virgil's *Eclogues*, *Georgics*, and *Aeneid*, the poetry of Catullus, Horace, Propertius, Ovid and the writers of the Silver Age, with reference to contemporary prose texts.
Reference: F. Copley, Latin Literature.

GLL 220 **Early Greek Literature** 2L,1T:MWF12
 A study of Greek literature and culture to the beginning of the Periclean Age. Homer's *Iliad* and *Odyssey*, Hesiod's *Descent of the Gods* and *Works and Days*, and examples of lyric and elegiac poetry will be among the works read.

GLL 230 **Greek and Roman Philosophy** 2L, 1T VUL:MW11, 1T:F11
 Readings from the Pre-Socratics, Plato, Aristotle and post-Aristotelian and Roman philosophical writings.

GRH GREEK AND ROMAN HISTORY

Given by the Intercollegiate Department of Classics

See also GRK, GLL, LAT

Students should refer to the essay published under "Classics"

NOTE: GRH courses do not require knowledge of Greek or Latin

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

GRH 100 **Greek and Roman Civilization** 2L, 1T UL1:TR9, TVL2:TR11, T:N
 Its political, economic and cultural evolution, beginning in an age of independent city-states, reaching rich maturity in the Hellenistic age of Great Powers, and culminating in the multiracial and multicultural Roman empire. Its place in world history.
Exclusion: GRH 200/201/300 if taken in the same year of study

GRH 200 **Greek History to the Death of Alexander** 2L, 1T UL1:TR10, ML2:MWF12, T:N
 Political, economic and intellectual progress and achievement in the Greek classical age.
Exclusion: GRH 100 if taken in the same year of study

GRH 201 **History of Rome from its Foundations to 31 B.C.** 2L, 1T UL1:TR11, VL2:MWF2, T:N
 Political, economic and cultural development accompanying Rome's evolution from city-state to world empire.
Exclusion: GRH 100 if taken in the same year of study

GRH 211 **Archaic Greece** 2S:W4-6
 The background of the classical achievement. This course will endeavour to assess the many influences which produced the peculiar cultural distinction of the classical age. Topics discussed will include the emergence of the city-state, the forms of society and government, and economic factors and their interrelationship with social and political development. (Offered in alternate years.) *M.E. White/M.G. Wallace*
Prerequisite: GRH 100/200

- GRH 212 **The Roman Revolution** (Not offered 1973-74) 2S
 A study of the transition from republic to principate, based upon original sources in translation. (Offered in alternate years.)
Exclusion: HIS 486 in the same year
Recommended preparation: GRH 100/201
- GRH 213 **The Jews in Greek and Roman History** (Not offered 1973-74) 2S
 The political, social and cultural consequences of the inter-reaction between the Jews on the one hand and the Greeks and Romans on the other. The course will investigate the attempts to reconcile and fuse divergent ways of life in the Diaspora and in Palestine, the conflicts which resulted and the often tragic resolutions of those conflicts. (Offered in alternate years.)
- GRH 214 **Law in Roman Society** 2S:M4-6
 The investigation of Rome's most enduring contribution to civilization with emphasis on the manner in which the law reflected the values of the community whose needs it served. An introduction to the nature of Roman legal reasoning. The historical development of Roman law from its beginnings to the complex maturity of its classical period will be studied against the background of the evolution of Roman society and Roman power. *E.J. Weinrib.* (Offered in alternate years.)
- INU 215 **The Individual and Society** (Formerly GRH 215) 2S:M4-6
 (See INU 215 under "University College Courses")
- GRH 216 **Alexander the Great and the Hellenistic Age** (Not offered 1973-74) 2S
 The psychology of power. The course will examine the relations of Alexander with his generals, as his conquests made him a threat to even his closest associates. (Offered in alternate years.)
Recommended preparation: GRH 100/200/201
- GRH 217 **The Greek Contribution to Political Thought** 2S:W4-6
 A study of the practice and theory of politics in the Greek world. (Offered in alternate years.) *J.R. Grant*
Recommended preparation: GRH 100/200
- GRH 218 **Religion in the Roman Empire** (Not offered 1973-74) 2S
 Classical paganism in theory and practice; impact of astrology, mystery religions and gnosticism. Syncretistic paganism in its relationship to Christianity. State policy with regard to religion. Intellectual bases, distinctive characteristics and spiritual values of the religious experience of late antiquity. *G.L. Keyes.* (Offered in alternate years.)
Recommended preparation: GRH 100/300
- GRH 219 **Education and Society in Greco-Roman Antiquity** (Formerly GRH 316) 2S:M4-6
 An examination of ancient educational theories and practices in relationship to the society which produced them. The course will include some discussion of rhetoric, philosophy, science, technology, the position of women, the "professions" and the influence of the classical system. (Offered in alternate years.) *J.M. Bigwood*
Recommended preparation: GRH 100
Exclusion: GRH 316
- GRH 221F **Herodotus' Histories** 2S:R4-6
 A study of the early development of historical writing in Greece, concentrating on the first major extant work, with attention to aims, methods, style and relation to other contemporary forms of literature. (Offered 1973-74 and in alternate years.) *J.W. Cole*
Recommended preparation: GRH 100/200
Exclusion: GRK 322 in the same or a previous year

- GRH 222F **Coins in the Greco-Roman World** (Not offered 1973-74) 2S
 This course will illustrate the variety of ways in which ancient coins throw light on ancient society. Problems to be discussed include the nature, origin and purpose of Greek and Roman coinage, and the use of Greek and Roman coins in economic, social and political history. (Offered in alternate years.)
Recommended preparation: Any GRH course
- GRH 223S **Thucydides** 2S;R4-6
 The study of Thucydides' *Histories* in their relation to the intellectual and political developments of fifth-century Greece, including such topics as Athenian democracy, imperialism, and the sophists. *P.S. Derow*. (Offered in alternate years.)
Exclusion: GRK 422 in the same or a previous year.
Recommended preparation: GRH 100/200
- GRH 224S **Status, Role and Profession in Ancient Greece** (Not offered 1973-74) 2S
 Beginning with the demographic data, this course will move on to examine the ways in which social grouping limited and defined individual human existence in ancient Greece. Topics will include the family and kinship groupings; age groups; position of women; slaves, aliens, and the disenfranchised; hereditary distinctions (e.g. priesthoods); specialized occupations (e.g. medical, itinerant craft). (Offered in alternate years.)
Recommended preparation: GRH 100/200
- INU 225 **The Bicultural Experience** (Formerly GRH 225) 2S
 (See INU 225 under "University College Courses")
- GRH 300 **The Roman Empire** 2L,1T:MWF9
 Constitutional, economic, military and religious problems of a world state and a declining civilization.
Exclusion: GRH 100 if taken in the same year of study
- GRH 310 **Roman Penetration of the Greek East** (Not offered 1973-74) 2S
 A study of Rome's eastward expansion from the earliest contacts with Greece to the end of the second century B.C. The course will focus upon the Roman conquest of the Greek world and the effects of Rome's growing power upon both the Greeks and the Romans themselves. (Offered in alternate years.)
Recommended preparation: GRH 100/201
- GRH 311 **Christianity in the Roman Empire** (Formerly GRH 220) 2S;W4-6
 The development of Christianity from the early second to the early fourth century, not considered in isolation but related as closely as possible to the society in which early Christianity expanded most successfully. (Offered in alternate years.) *T.D. Barnes*
Recommended preparation: GRH 100/200/201/300/REL 201/303
- GRH 312 **Studies in Greek History of the Fifth Century** (Not offered 1973-74) 2L, 1T
 Aspects of life in the golden age of Greece. (Offered in alternate years.)
Exclusion: HIS 485 in same year
Prerequisite: GRH 100/200
- GRH 313 **The Julio-Claudian Emperors** 2S;W4-6
 The period from the death of Augustus (A.D. 14) to the death of Nero (A.D. 68) saw the transformation of almost all aspects of Roman life—political, economic, cultural and religious. This course will attempt to analyse the causes and course of the transformation, relying mostly on the original sources in translation. (Offered in alternate years.) *A.M. Dabrowski*
Exclusion: LAT 420 in the same year
Prerequisite: GRH 100/201/300

- GRH 317 **Greece, Rome and the Philosophers of History** 2S:R4-6
 Classical civilization as analysed by St. Augustine, Hegel, Karl Marx, Spengler, Toynbee and McNeill. Its peculiar quality; its general resemblance to other historical civilizations; in relationship to other civilizations, and contribution to human "progress." (Offered in alternate years.) *G.L. Keyes*
Prerequisite: GRH 100
- GRH 318 **Transition to the Middle Ages** (Not offered 1973-74) 2S
 The Roman Empire, its neighbours and invaders, from the second to the early seventh centuries. (Offered in alternate years.)
Recommended preparation: GRH 212/300
- GRH 319S **Constantine the Great and His Age** 2S MS:TR1
 Power politics and religious experience in a formative period in the development of Western civilization. *R.M. Toporoski*
- GRH 323 **Greek and Roman Historiography** (Not offered 1973-74) 2S
 A study in the development of the methodology and philosophy of historical writing in Greek and Roman antiquity. Excerpts from the works of all the major historians will be studied during the course of the year. (Offered in alternate years.)
Recommended preparation: Any GRH course
- NOTE: Students should see also HIS 485 and 486.

GRK**GREEK**

Given by the Intercollegiate Department of Classics

See also GLL, GRH, LAT

Students should refer to the essay published under "Classics"

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- GRK 100 **Introductory Greek with Selected Readings** 4S UVS1:MTWR1, TMS2:MWF9, F1
 This course is designed to introduce beginners to the ancient Greek language and to prepare them for the reading of Greek literature.
- GRK 120F **Socrates on Trial** 3S US1:MWF10, MS2:MWF3
 Plato: *Apology of Socrates*. Further study of language.
Prerequisite: XIII GRK/GRK 100
Co-requisite: Any other half or full course in the same subject
- GRK 121S **Socrates on the Comic Stage** 3S US1:MWF10, VS2:MWF3
 Aristophanes: *Clouds*. Further study of language.
Prerequisite: XIII GRK/GRK 100
Co-requisite: Any other half or full course in the same subject
- GRK 122F **Athenian Society as Reflected in the Courts** 3S MS:MWF2
 Family, trade, welfare, and finance in fourth-century Athens, in the speeches of Lysias and Demosthenes. Further study of language. Lysias: *Against the Corndalers, On the Cripple*; Demosthenes: *Against Conon*; further selections from Demosthenes.
Prerequisite: XIII GRK/GRK 100
Co-requisite: Any other half or full course in the same subject

GRK 123S **The Wanderings of Odysseus** 3S:MWF2
 Homer: *Odyssey*, 6, 9, 11. Further study of language.
Prerequisite: XIII GRK/GRK 100
Co-requisite: Any other half or full course in the same subject

GRK 150 **Introductory Modern Greek** 3L, 1P:MW7-9
 This course is designed to introduce beginners to the Modern Greek language in its oral and written form. At least one hour a week of laboratory work is mandatory.

GRK 245 **Intermediate Modern Greek (Formerly GRK 155)**

GRK 250 **Modern Greek Literature**

(These courses are described in the section which follows.)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

GRK 220 **Greek Tragedy** 3S:TR3, W4
 With reading of: Aeschylus, *Prometheus Bound*; Sophocles, *Antigone*; Euripides, *Hippolytus* or *Medea*.
Prerequisite: GRK 100/two of GRK 120F/121S/122F/123S

GRK 222F **Herodotus** 3L:MWF11
 The beginning of the writing of History. Readings of selections from Herodotus, Books I and V. Prose Composition (required of Specialists only).
Prerequisite: GRK 100/two of GRK 120F/121S/122F/123S

GRK 223S **Eros and Philosophy** 3S:MWF9
 Reading of Plato, *Symposium*. Prose Composition (required of Specialists only).
Prerequisite: GRK 100/two of GRK 120F/121S/122F/123S

GRK 245 **Intermediate Modern Greek (Formerly GRK 155)** 3L:MWF1, 1P:N
 The course continues the work of GRK 150 and prepares students for the reading of Modern Greek literature and/or the study of ancient Greek.
Prerequisite: GRK 150 or equivalent grounding in Modern Greek

GRK 250 **Modern Greek Literature** 3S:TR1
 Prose and poetry of nineteenth and twentieth century Greece. A survey of literature since Independence. Open also to First Year students.
Prerequisite: GRK 245, unless the student is a native speaker of the language

GRK 350 **Contemporary Greek Literature**
 (This course is described in the section which follows.)

NOTE: Students of GRK should see also NES 251.

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

GRK 320 **Greek Epic** 2L,1T:MWF10
 With reading of Homer *Iliad*.
Prerequisite: Any GRK 200-series course, preferably 220

GRK 321 **Introduction to Plato** 2L,1T:MWF12
 With reading of the *Republic*.
Prerequisite: Any GRK 200-series course, preferably 221

- GRK 322 **Greek History to 479 B.C.** 2L,1T:MWF11
 With reading of Herodotus, 6, 7, 8.
Prerequisite: Any GRK 200-series course, preferably 221
- GRK 350 **Contemporary Greek Literature** 2S:TR12
 Reading of representative authors of 20th century Greece with special attention to works which continue and reshape the classical tradition. (Open also to Second-Year students.)
Prerequisite: GRK 250 or equivalent grounding in Modern Greek literature
- GRK 420 **Seminar in Greek Drama** 2L,1T:N
 With reading from plays of Aeschylus, Sophocles, Euripides and Aristophanes, and Aristotle *Poetics*.
Prerequisite: GRK 220/320
- GRK 421 **Seminar in Greek Philosophy** 2L, 1T:N
 With readings to include the Pre-Socratics and Aristotle *Categories* and *Nicomachean Ethics*.
Prerequisite: GRK 221 or any 300-series course in Greek
- GRK 422 **Seminar in Greek History from 479-404 B.C.** 2L,1T:N
 With reading from Thucydides 1, 2-5 (selections) 6, 7.
Prerequisite: GRK 221 or any 300-series course in Greek
- GRK 423 **Seminar in Greek Lyric Poetry** 2L, 1T:N
 With reading of *Greek Lyric Poetry* (Campbell); selections from Pindar, Theocritus and Callimachus.
Prerequisite: Any GRK 200-series or 300-series course
- GRK 430Y **Greek Prose Composition** N
- GRK 450 **Seminar in Contemporary Greek Drama** 2S:R4-6
 Reading of representative dramatists of Modern Greece, with special attention to authors who reinterpret the Classical myths.
Prerequisite: GRK 350

NOTE: Students of GRK should see also LAT 431Y and NES 351, 451

HEBREW - See NES "Near Eastern Studies"
 HINDI and HINDUISM - See SIS "Sanskrit and Indian Studies"

HIS

HISTORY

<i>Chairman of Department:</i>	Professor J.B. Conacher
<i>Associate Chairman:</i>	Professor M. Israel
<i>Enquiries:</i>	Sidney Smith Hall, Room 2074 (928-3363)

The Department of History at the University of Toronto at present consists of more than sixty full-time members of staff, whose professional interests range through such diversified areas of History as: British and Commonwealth, Canadian, East Asian, East European, European, International Relations, Latin American, Russian and United States. In the British and the European areas, the medieval as well as the modern periods are fully covered. We aim, in the various undergraduate courses of the Department of History, to introduce the student to a range of study which is as wide and as deep as possible.

Our basic approach to instruction in these courses is to combine lectures with small tutorial groups

in which the students and the tutor can explore historical problems in depth. In upper-level courses, instruction may take the form of lectures without tutorial groups, or seminars without lectures.

A Specialist Programme in History is a four-year programme which includes at least nine full-year courses or equivalent from the offerings of the Department. Courses from other departments (normally not more than three) may be substituted for History courses with the approval of the Specialist Programme Committee. Within this general prescription: (a) the nine courses must be chosen from a minimum of three areas; (b) in each of two areas a minimum of two 300- or 400-series courses must be chosen; (c) of the nine courses, at least two must deal exclusively with periods preceding the year 1815. Students who seek to specialize in *both* History and one other discipline (*double certification*) must take at least seven courses in History. The seven courses must be chosen from a minimum of two areas; in one area, a minimum of two 300- or 400-series courses must be chosen; of the seven courses, at least one must deal exclusively with periods preceding the year 1815. Through its system of advisers, the Department assists each Specialist in choosing his History courses and also his other courses in order that he may construct a well-integrated programme. The old Specialist regulations (seven courses in History not including HIS 100) continue to apply to those students who entered the University in September 1969 or before.

A departmental handbook is available each year at the time of preregistration in the spring. Courses in History are also offered in the following departments:

- Classics (GRH)
- Sanskrit and South Asian Studies (SIS)
- Islamic Studies (ISL)
- Near Eastern Studies (NES)
- East Asian Studies (EAS)

Specific courses in History offered outside the History Department are listed in the departmental handbook.

There is an active History Students' Union in the department, and there is student participation in the department meetings and major standing committees.

COURSES RECOMMENDED FOR FIRST-YEAR STUDENTS

- HIS 101 The Emergence of the Third World** 2L:TR11, 1T:N
 An inquiry into the composition and nature of the economically under-developed regions of the world, especially Latin America, Africa, and East Asia; and an investigation of the historical and contemporary conditions that have given rise to a collectively shared "third world consciousness" among the peoples and nations of these regions. *T.M. Brady, P.L. Thompson.*
Exclusion: HIS 102/103/104/105
Prerequisite: No Grade XIII prerequisite is required
- HIS 102 Introduction to the Study of History** 2L:TR2, 1T:N
 Selected aspects of the theory and practice of history: an inter-disciplinary approach to the problems of historical analysis and interpretation. A variety of topics of current and historical interest will be used to illustrate historians' techniques. *J. Dent.*
Exclusion: HIS 101/103/104/105
Prerequisite: No Grade XIII prerequisite is required
- HIS 105 Ideology and Society in Western Civilization** 1L:F1, 1T:N
 An exploration of major themes in Western culture, from the Middle Ages to the present. Lectures and readings will focus on selected figures and movements, rather than attempting a comprehensive view of the whole. *E.L. Shorter*
Exclusion: HIS 101/102/103/104

COURSES OPEN TO STUDENTS FROM ALL YEARS

- HPS 200 History of Scientific Ideas**
 See "History and Philosophy of Science and Technology." (HPS)

- HPS 201 **History of Technology and Engineering**
See "History and Philosophy of Science and Technology." (HPS)
- HIS 206 **Mediaeval and Modern History of the Jews** 2L:TR10; 1T:N
This course deals with the epoch from the Arabic Conquest to the end of the 19th century. The history of the Jews in the important centres will be discussed: Babylonia, Egypt, Spain, Western and Eastern Europe. The following aspects will be considered: legal and political status, economic activity and place in society, self-government, intellectual interests and achievements.
Exclusion: HIS 207, 1972-73; HIS 307, 1971-72
- HIS 220 **The Shape of Mediaeval Society** 2L:TR11, 1T:N
A topical survey of economic, political, religious and educational ideas and institutions of the Middle Ages. The narrative of political events is kept to a minimum, serving only to provide the necessary context for institutions and ideas. From the late Roman period to the fifteenth century. *R.V. Colman, T.A. Sandquist, N.P. Zacour.*
- HIS 230 **Politics and Social Change in England, 1530-1800** (Not offered 1973-74) 2L, 1T
This course studies the formative period of modern English history. The main aim is to relate changes in the social structure and economy to changes in the political system, in particular to the struggle for power in the seventeenth century and the emergence of a stable political system in the eighteenth. *J.M. Beattie, M.G. Finlayson.*
- HIS 231 **British History in the Nineteenth and Twentieth Centuries (Formerly HIS 331)** 2L:TR11, 1T:N
The major themes of British history from the late eighteenth century: the emergence of industrial society, the fate of aristocracy, religion, cultural and intellectual change; external relations, constitutional development and political history. *J.B. Conacher, T.O. Lloyd.*
Exclusion: HIS 331, 1972-73
- HIS 232 **The British Imperial Experience** 2L:TR12, 1T:N
Among the themes to be emphasized are: the nature and exercise of power; the reasons for imperial expansion; the colonial system at work; racial antagonism and accommodation; the rise of nationalism in the non-European world. *M. Israel, A.P. Thornton*
- HIS 240 **Early Modern Europe, 1500-1815** 2L:TR9
A general survey of the political, social and economic history of Europe from the period of the great discoveries through the Napoleonic era. Topics to be discussed include: the political and religious struggles of the 16th century; overseas expansion; the development of royal absolutism; social change and the crisis of the ancient regime; the impact of the Enlightenment; the French Revolution and its effects. *W.J. Callahan, J.M. Estes.*
- HIS 241F **Nineteenth Century European Politics, Culture and Society** 2L:TR2, 1T:N
This course deals with the new ideologies of liberalism, nationalism and imperialism that affected the European polity. *R.F. Harney.*
Exclusion: HIS 241 (1971-72)
- HIS 242S **Europe in the Contemporary Era, 1890-1953** 2L:TR2, 1T:N
Themes in European history from the *belle époque* to the Cold War. Lectures and readings will explore questions of political, social, and intellectual importance during the period. Among these: the World Wars, the Bolshevik Revolution, Stalinism, the emergence of technocracy, the Great Depression, Fascism, Nazism, and postwar reconstruction. *R.A. Spencer.*
Exclusion: HIS 241 (1971-72)

- HIS 250 Russia Since the Ninth Century** 2L:MW1, 1T:N
The Russian people, state and culture, with emphasis on major institutional social and ideological changes. First term: the origins of Russian History, paganism and Christianity, Mongol influences, the forging of Muscovite autocracy, westernization to 1800; Second term: the imperial regime, the radical intelligentsia, the Revolution and the establishment of the Soviet regime, the Stalin revolution in agriculture, industry and society, foreign relations. Reading in primary and secondary materials. *J.L.H. Keep, A. Rossos*
- HIS 260 Pre-Confederation Canada** 2L:TR12, 1T:N
Studies in the major problems and themes of the history of Canada before Confederation. *W.J. Eccles, G. Patterson, P. Rutherford.*
Exclusion: HIS 262
- HIS 261 Post-Confederation Canada** 2L:TR1, 1T:N
Studies in the major problems and themes of the history of Canada after Confederation. *R. Bothwell, C.C. Berger, P. Rutherford.*
Exclusion: HIS 262
- HIS 262 History of Canada** 2L:TR1
A survey of the political, social and economic history of Canada, topically treated from 1663 to 1973. *J.M. Bliss, J.M.S. Careless.*
Exclusion: HIS 260/261
- HIS 271 American History Since 1763** 2L:MW11, 1T:N
Major themes since the American Revolution, including independence and political reorganization, political parties, territorial expansion, the sectional crisis, industrialization, progressivism, the United States as a world power. *R.D. Accinelli, P.C.T. White.*
Exclusion: HIS 270, 1972-73
- HIS 280 History of East Asian Civilization** 2L:TR1, 1T:N
The lecture portion of the course is the same as that of EAS 102. The tutorial portion is different. *P.L. Thompson.*
Exclusion: EAS 102
- HIS 290 Latin America: Conquest to Revolution** 2L:MW2, 1T:N
Analysis of the historical basis of the contemporary revolutionary crisis. Main themes are: the impact of the Spanish conquest and native responses, the development of underdevelopment, and the emergence of nationalism and revolution. Though the primary emphasis will be Latin America, attention will also be devoted to the non-Hispanic Caribbean. *T.M. Brady, H. Marcus.*
- HIS 295 History of Sub-Saharan Africa to 1900** 2L:TR3, 1T:N
Traces major themes in the historical development of African peoples from the earliest known times through the partition of Africa. These themes include population movement, the development of trade and technology, the growth of kingdoms and empires, the history of African Islam, the impact of the slave trade, and increasing impact of the industrial West on African societies. *M. Klein.*

COURSES OPEN TO THIRD- AND FOURTH-YEAR STUDENTS

- ISL 300 The Ottoman Empire and Modern Turkey**
(See ISL under "Islamic Studies")
- JMC 300 Modern China in Revolution**
(See JMC under "Joint Courses")

- HIS 301 History of Spain, 1652-1939** 1L, 1T:TR10
A general introduction to the history of Spain. Topics to be discussed include the crisis on the 17th century monarchy, 18th century enlightened reformism, the collapse of the old regime, the emergence of liberalism, and regional separatism in the 19th century and the disintegration of political and social stability in the 20th. Also open to second-year students. *W.J. Callahan.*
- HIS 302 France since the Revolution of 1789** 2L:TR2, 1T:N
A study of developments from the later eighteenth century in French politics, culture and society. Also open to second-year students. *J.C. Cairns, D.C. Higgs.*
- HIS 303F The Italian Renaissance** (Not offered 1973-74) 2L, 1T
Intellectual history of the Italian Renaissance from Petrarch through 1540, in the context of the social and political life of the Italian cities. *P.F. Grendler.*
- HIS 304 Franco's Spain, 1936-1972** 2S:R4-6
The political, social and economic history of Spain from the Civil War to the present. *W.J. Callahan.*
- HIS 305F Europe and the Second World War** 2S:W9-11
A study of the immediate background, the events, and the impact of the war, 1918-1957. The actual military developments of 1939-1945 will receive less attention than the political, economic and social aspects of this time. The approach will be one in which the war itself is treated as the extreme upheaval within a much longer period of social change. *J.C. Cairns.*
Prerequisite: A course in the recent history of Europe or permission of the instructor
- HIS 306S Intellectual History of Modern Jewish Nationalism** 2S:T4-6
A study of the main theories of modern Jewish nationalism. The writings of figures such as Hess, Herzl, Ahad Ha'am, Borochoy, Buber and Jabotinsky, will be investigated. Anti-nationalist theory will be examined, especially the liberal-assimilationist and socialist-internationalist critiques of Zionism. Stress will be laid on the European historical context, and the influence of the ideologies of European nationalism, socialism, Nietzscheanism, etc., on Jewish nationalism. *J. Kornberg.*
- HIS 310 Iroquois** 2S:R4-6
The history of Canada as viewed from the perspective of an indigenous people, from pre-historic times to the present. Readings will include anthropological and ethnological studies as well as historical literature. *G. Patterson.*
- HIS 311F Introduction to Canadian International Relations** 3L:MWF2
This course is designed to place Canadian international affairs in a broader context than is usually done. It will focus on Anglo-American as well as Canadian-American relations, and will provide some of the European background to questions such as the League of Nations, appeasement, rearmament, which directly affected Canada without this country being consulted. *R. Bothwell.*
- HIS 312S Twentieth Century Canada** 1L, 1T:TR10
Major problems and themes in Canadian history, 1919-1960. *R. Bothwell.*
Exclusion: HIS 363 (1971-72)
- HIS 313 Canadian Labour and the Left** 2S:W4-6
A topical study of the development of the trade union movement in Canada with special reference to its development of a political programme and its search for a political expression. *D. Morton.* (Not offered 1974-75.)

- HIS 314 **French-Canadian History I** 2L:TR11, 1T:N
Lecture course on French Canada. For details consult the Department of History.
- HIS 320 **Science in Western Intellectual History** 2S:N
Development of scientific thought from the 17th century through the 19th century relating science to other areas of intellectual history. Scientific ideas in France, Britain, Germany, Holland and Italy will be related to concurrent philosophical and sociological ideas. The organization of science, the dissemination of ideas through scientific societies and the universities, and the relations of science and religion will be included. *T.H. Levere, M.P. Winsor.*
- HIS 323 **Topics in Early Mediaeval Economic History** (Not offered 1973-74) 2S
The problems to be examined include the economic decline of the ancient world, the Pirenne Thesis, the Carolingian seigneurie, the impact of the Viking invasions, and the eleventh-century revival. *W.A. Goffart.*
- JAH 324 **Peasants and Feudal Institutions**
(See JAH under "Joint Courses")
- HIS 325 **Politics and Society in Mediaeval England** 2L:TR3, 1T:N
Freedom and authority in the context of social development (family, lordship, class structure, nobility, bourgeoisie, revolutionary movements) from the Anglo-Saxons to the Yorkists. Interplay of social, political, and cultural forces stressed where appropriate. Translated documents are used to enable students to form their own opinions on contentious issues. *M.R. Powicke.*
- HIS 328 **England 1154-1307** 2S:W4-6
Studies in the political, religious, social, legal, and economic history of England from the accession of Henry II to the death of Edward I. *T.A. Sandquist.*
Prerequisite: Previous university-level course in Mediaeval history or permission of instructor.
- HIS 334 **Religion in Britain from the Reformation to the Victorian Age** 1L, 1T:MW10
The evolution of the Church of England and its parties; the Kirk of Scotland to the Great Disruption; the older non-conformity from Puritans to Unitarians; the Methodist, Evangelical and Oxford movements; the decay of faith in the industrial age. The course, while concentrating on the separation of several different religious alternatives, will also look at insular initiatives in spirituality, faith and works. *E.E. Rose.*
- HIS 339 **Victorian Society** 1L, 1T:TR3
Studies in the major themes of English social history from 1815 to 1900. Some of the subjects to be considered are: the social context and consequences of industrialization, the development of cities, the changing status of women, the family, popular culture, religion, and the social aspects of politics. *R.J. Helmstadter.*
- HIS 340 **The Foundations of Modern Germany, 1519-1806** 2L:TR3
The political, constitutional, and social history of the Holy Roman Empire and its most important territories (e.g., Prussia and Austria) from the opening of the modern period through the Congress of Vienna. Group discussions within the lecture periods. Also open to second-year students. *J.M. Estes.*
- HIS 341 **Italy Since 1789** 1L, 1T:MW12
The unification of the Italian peninsula, the liberal regime (1870 to 1922); and the Fascist era. Liberalism, nationalism, imperialism, and church-state relations are the major themes. The socio-economic problems that caused emigration and the impact of emigration are also studied. *R.F. Harney.*

- HIS 342 **European Intellectual History** 2L:MW10, 1T:N
The ideas, attitudes and myths of representative intellectuals in Europe, 1815-1914. Social and historical context of intellectual trends are considered. Representative thinkers include St. Simon, Fourier, Comte, Hegel, Feuerbach, Marx, Schopenhauer, Nietzsche, Mill, Darwin, Freud. *J. Kornberg.*
- JHP 343 **Introduction to South African History and Politics**
(See JHP under "Joint Courses")
- HIS 344 **Conflict and Cooperation in the International Community Since 1856** 2L, 1T:MWF12
An enquiry into the basic forces affecting the issue of peace and war during the transition in global politics from the European ascendancy to the dominance of the nuclear Super-Powers; the search for peace through alliances, balance of power, and international institutions; the development of international institutions for political, economic, humanitarian, environmental, and other areas of international cooperation. *H.I. Nelson.*
- HIS 345 **France and Her European Neighbours, 1589-1715** 2S:W4-6
The course deals essentially with the Absolutist experiment in France, the society which that experiment tried to transform, and the rise of a new intellectual and moral consciousness which it attempted to control. Stress will be placed on quantitative methods of analysing social and institutional structures. Comparative studies will be undertaken of contemporary developments in England and Holland. A reading knowledge of French is desirable. *J. Dent.*
- NOTE: Students interested in European history should also refer to HIS 301, 302, 303F, 305F and 306S.
- HIS 350 **East Central Europe to 1939** 2L, 1T:MWF11
I: The Polish, Bohemian, and Hungarian background; the Balkans in the late mediaeval and early modern periods. Renaissance, Reformation, and Counter-Reformation, decline and national revival to the beginning of the nineteenth century. II: Partitioned Poland, nationalism in the nineteenth century; World War I, Peace Settlement and interwar years. *P. Brock.*
- HIS 351 **Topics in Soviet History** 1L, 1T:TR12
I: general survey of Russian history since 1917: foundation and consolidation of the Soviet state, N.E.P. and its repercussions; the Stalin revolution; economic and social changes; foreign policy before and after World War II; post-Stalinist Russia. II: analysis of specific problems, particularly the period since 1928, including: the role and content of ideology, Party and government structure, Soviet legality, planning system, collective farming, cultural policy, intellectual dissent, etc. *J.L.H. Keep.*
Prerequisite: HIS 250, or permission of instructor
- HIS 360S **The Canadian Political Tradition** (Not offered 1973-74) 2L
An examination of the development since the 1830's of conservative, liberal and radical approaches to the ideas and methods of Canadian political life. *K.W. McNaught.*
- HIS 361 **Strategies of Canadian Economic Development, 1850-1970** 3L:MWF12
Approaches to economic development in Canadian history; their implications and consequences. The establishment of networks of transportation and communication, the growth of industry, the role of government in economic affairs, class and group conflicts over economic goals. *J.M. Bliss.* (Not offered 1974-75.)
- HIS 364 **Canada and War: 1867-1967** (Not offered 1973-74) 2S
A study of the social and political impact of war and military preparedness on Canada from the first Dominion Militia Act to the unification controversy. *D. Morton.*

- HIS 365S **Patterns of English-Canadian Nationalism, 1850-1970** 2L:MW1
A study of nationalist rhetoric in five areas: the British Empire and Canadian imperialism, the American presence and continentalism, French Canada and national defence, the maturing of English Canada, and the development of a western regionalism. *P. Rutherford*.
Exclusion: HIS 362 (in 1971-72).
- HIS 366 **Studies in Late Victorian Canada, 1850-1900** 2S:W4-6
The development of regional communities and a national consensus in British America, largely after Confederation, with particular attention to popular attitudes and ideology. Such topics as political philosophies, political leadership, pluralism, social doctrines, economic nationalism, sectionalism, continentalism and imperialism, ultramontanism and the rouge challenge, Anglo-Saxon racism. *P. Rutherford*.
Exclusion: HIS 466
- HIS 367 **Canadian-American Relations** (Not offered 1973-74) 2S
Detailed and comprehensive coverage of the diplomatic relations between Canada and the United States. Attention given to the economic, social and cultural relations between the two countries. *P.C.T. White*.
- HIS 368 **The Canadian West** 2S:T4-6
The prairie west since the mid-nineteenth century. The focus will be upon the emergence of a distinctive region and its place in Canadian development. The approach will be broadly social and cultural. *C. Berger*.
- NOTE: Students interested in Canadian history should also refer to HIS 310, 311F, 312S, 313 and 314.
- HIS 370 **The American Political Tradition** 2L,1T:MWF2
Conflict and consensus in American political history from the Revolution to the present time. An attempt is made to analyze, and explain the persistence of the ideological and pragmatic strains in American politics. The course deals with American foreign relations as well as with domestic politics. *W.H. Nelson*. Enrolment limited to 35 students.
- HIS 371 **Evolution of American Nationalism** 1L, 1T:TR10
This course will range over the whole period of American history, but will concentrate on the years from Independence to the end of the Civil War. From time to time a comparative approach will be used in order to place American nationalism in a larger setting. Travel accounts and literary materials will be used, as well as the works of leading figures such as Jefferson and Lincoln. *G.M. Craig*.
Prerequisite: A previous university-level course in American history
- HIS 372 **The United States in the Twentieth Century, 1895-1970** 3L:MWF2
A survey and analysis of the political, economic and social institutions, and foreign policy commitments of the United States. *W.C. Berman*.
- HIS 374 **Society and the Sexes in North America from the 17th to the 20th Century** 2L:TR5, 1T:N
The following subjects will be examined in a North American context; family structure, demographic patterns, female participation in the labour force and in religious and political movements, changes in sex roles, stereotypes of male and female temperament, consciousness concerning the subordination of women, male and female alienation. A brief introduction dealing with similar topics in the context of early modern Europe gives comparative perspective. *J.K. Conway*.
Exclusion: HIS 348/348F 1972-73
- HIS 375 **Nineteenth Century American History** 2L, 1T:TR11
Course to be offered by a visiting professor. For details, consult the Department of History.

- HIS 378 Ethnicity in American History** 2S:F9-11
The seminar will consider the extent to which the United States has been a "melting pot," including migrations to and settlement patterns in America, concepts of nationality and race, and problems of assimilation and acculturation. Black history and Indian-White relations will also be discussed, although the focus will be on non-Anglo-Saxon immigrants. *W.B. White.*
- HIS 379F Aspects of American Progressivism** 2S:R4-6
A study of the main themes of American progressivism since 1880. *K.W. McNaught.*
- HIS 380 Modern China, 1600-1911** 1L, 1T:TR11
Modern Chinese history with emphasis on the interaction of intellectual, social, economic and political factors, culminating in the collapse of the traditional system of government in the Revolution of 1911. *J.L. Cranmer-Byng.*
- HIS 381 Modern Japan Since 1550** 2L, 1T:MWF11
An inquiry through social and cultural history, and through translated literary selections, into Japan's historical and contemporary position in East Asia and the world. Course work involves isolating and defining cultural elements unique to Japan, and relating these to the shape of modern Japanese history. *P.L. Thompson.*
Exclusion: HIS 381F (1972-73)
- HIS 382 Modern India: the Nineteenth and Twentieth Centuries** 1L, 1T:TR2
The Sub-continental Empire which emerged from the eighteenth-century struggle for power: British conquest, cultural and intellectual change, institutional development, social revolution, the vagaries of the economy, nationalist struggle, and the first 25 years of independent statehood are the major themes. *M. Israel.* Also open to second-year students.
- HIS 393F Topics in Brazilian Social History** 2S:M4-6
This course will examine selected topics in the social history of Brazil in the nineteenth and twentieth centuries. Topics to be studied include: the struggle for abolition and the role of the Negro in post-abolition Brazil, Northeastern messianic movements, and the condition of the immigrant in southern Brazil. *H. Marcus.* (Not offered 1974-75).
Prerequisite: One course in any discipline dealing with Latin America or permission of the instructor
- HIS 394S Selected Themes in Latin American History** 2S:M4-6
This course will investigate, within a literary-historical approach, selected themes in Latin American history. Major works of Latin American fiction will be read in conjunction with historical sources. Among the authors to be read are: Ricardo Guiraldes, M.A. Asturias, Gabriel García Márquez, Machado de Assis, and Graciliano Ramos. *H. Marcus.*
(Not offered 1974-75).
Prerequisite: One course in any discipline dealing with Latin America or permission of the instructor
- HIS 395 The Colonial Situation in Modern Africa** 2L:W4-6
An examination of major problems in the history of colonial Africa. Among them are the nature of European domination, the extension of the market economy, resultant forms of social and economic change, African resistance, labour activity, religious movements and the origins of modern nationalism. *M. Klein.*

- HIS 397 Independent Studies** N
This course will assume either of two forms: first, the preparation of an undergraduate thesis: or, second, the study of the literature of a special subject. Students wishing to take this course must find an appropriate faculty supervisor, receive approval for the project, and then apply in writing to the Independent Studies Committee. Details may be obtained from the departmental office. Application deadline: 15 June of previous term.
- HIS 398F Independent Studies** N
This course will assume either of two forms: first, the preparation of an undergraduate thesis: or, second, the study of the literature of a special subject. Students wishing to take this course must find an appropriate faculty supervisor, receive approval for the project, and then apply in writing to the Independent Studies Committee. Details may be obtained from the departmental office. Application deadline: 15 June of previous term.
- HIS 399S Independent Studies** N
This course will assume either of two forms: first, the preparation of an undergraduate thesis: or, second, the study of the literature of a special subject. Students wishing to take this course must find an appropriate faculty supervisor, receive approval for the project, and then apply in writing to the Independent Studies Committee. Details may be obtained from the departmental office. Application deadline: 8 December of previous term.
- JMC 400 Nationalism and Social Change in Contemporary China**
(See JMC under "Joint Courses")
- HIS 401F Historians and Their Philosophies: Philosophers and Their History** (Not offered 1973-74) 2S
A study of the works of a few modern philosophers on the logic of history, with a view to assessing its relevance and/or usefulness to the practising historian. *M.G. Finlayson.*
- HIS 402S History and Historians, Nineteenth and Twentieth Centuries** 2S:W9-11
Studies in the philosophy, methodology and literary techniques of some major historians in Europe and America, based on their formal works and their correspondence. *J.C. Cairns.*
- HIS 406 Jewish Self-Government in the Middle Ages and Early Modern Period** 2S:T3-5
Discussion of institutions and their composition; politics; functions of self-government; social problems; super-communal organizations.
- HIS 412 Canada in the Great Depression** 2S:M9-11
First Term: A reading course considering the impact of the great depression on Canadian society and politics. Second Term: the presentation and discussion of research papers on topics selected during the first term. *J.M. Bliss.* (Not offered 1974-75.)
Prerequisite: Three courses in Canadian history or permission of the instructor.
- HIS 425 Barbaric Law and Society** 2S:M4-6
Working from the texts of the *Leges Barbarorum*, and using other literary and historical source material where relevant, this seminar will focus on the structure of mediaeval society as revealed in its laws and legal procedures. Attention will also be given to the changes in scholarly opinion on the subject in the seventeenth, nineteenth, and twentieth centuries, and the reasons for those changes. *R.V. Colman.*
- HIS 427 The Mediaeval Church** (Not offered 1973-74) 2S
Problems in church and state from Constantine to the Conciliar Period. *N.P. Zacour.*
- HIS 428 The Age of Wycliffe** (Not offered 1973-74) 2S
Studies in the political, religious, social, and economic history of England in the second half of the fourteenth century. *T.A. Sandquist.*
Prerequisite: Previous course in mediaeval history.

- HIS 430 **The Decline and Fall of the British Empire** 2S:F10-12
This course will examine and assess the changes in the world-position of Great Britain between 1850 and 1970. It will concentrate on the dwindling of British strategic and economic power, with due reference to the policies, attitudes, and assumptions of the statesmen of the day and of public opinion in general. *A.P. Thornton.*
- HIS 433 **Selected Topics in Tudor History** 2S:T4-6
Some suggested topics: the bonds of society; capital and provinces; puritans and progress; the self-projection of an age in its literature. *E.E. Rose.*
- HIS 434 **Problems in 17th Century English Social and Political History** (Not offered 1973-74) 2S
An examination of some of the major developments in the political, social and economic history of Stuart England. Topics will be selected from a list including the following: the political origins and the consequences of the Revolution; the destabilizing and stabilizing forces in society; the European context of English political change; changing patterns of landownership. *M.G. Finlayson.*
- HIS 435 **Eighteenth Century English Society** (Not offered 1973-74) 2S
The main aim of the course is to study English social structure in the 18th century and especially social change during the industrial and agricultural revolutions. Some attention will also be paid to the political system and the relation of politics to social-economic change. *J.M. Beattie.*
- HIS 437S **Trade Unions and Labour Violence** 1L, 1S:R4-6
This course will study the extreme cases in industrial relations: the problems that arise when strike action spills over into violence. While British industrial relations during the last hundred years provide a framework for the course, at least half the time will be spent on problems in other countries—selected as far as possible to meet the interests of the class. *T.O. Lloyd.*
- HIS 441 **The Revolutionary Idea in France** 2S:M4-6
The first term is an in-depth study of the French Revolution and Napoleon. The second term is an analysis of the alternatives to bourgeois society put forward by French intellectuals during the nineteenth and twentieth centuries. *D.C. Higgs.*
- HIS 442 **The History of the Family in the West** 2S:W4-6
Reading in selected problems of family history in North America, England and Europe: the change from institution to companionship, the liberation of the woman within the family, how relationships between men and women have changed, the emergence of adolescence and of intergenerational conflict. Emphasis will be on using the past to understand the contemporary family. *E.L. Shorter.*
- HIS 443 **European Culture and Society in the Belle Epoque** (Not offered 1973-74) 2S
An analysis of major themes in European history at the end of the 19th century with special emphasis on the relationship between political, social, and intellectual currents. France will be at the centre of attention, though there will also be an examination of developments in Britain and the German Empire. Reading knowledge of French or German is desirable but not essential. *M.R. Marrus.*
- HIS 444 **The French in the Contemporary World, 1871-1962** 2S:T4-6
Major topics and themes in the political, social, diplomatic and intellectual history of modern France. First term devoted to preliminary exploration and reading on specific aspects agreed upon between the instructor and the students. *J.C. Cairns.*
Prerequisite: HIS 241F and 242S or permission of instructor.

- HIS 447 Studies in Nineteenth Century Intellectual History** 2S:W4-6
Major French, German and English intellectuals, 1815-1914. Focus on views about morality, work, love, political activism, political quietism, individualism, the social group, the state, placed in their historic and social context. *J. Kornberg*.
Prerequisite: At least one University course in modern European history or the equivalent.
- HIS 448 The Course of German History, 1806-1970** 2S:T4-6
An examination of the main trends in German history since the collapse of the Holy Roman Empire. The form of instruction is flexible. First term: primarily a series of lectures and tutorials; second term; research papers and seminar discussions. A reading knowledge of German is helpful but not essential. *R.A. Spencer*.
Prerequisite: HIS 241F and 242S or permission of instructor.
- HIS 455 Topics in Russian Social and Intellectual History of the 18th and 19th Centuries** (Not offered 1973-74) 2S
Themes and problems relating to Russian historical demography; the state, gentry and bureaucracy; social class and social transformation; industrialization; conservative and radical thought; historiography; the Revolution of 1917. This seminar is also designed to introduce students to the tools and skills of the historian, and to familiarize them with bibliography and the craft of historical research and writing. *H.L. Dyck*.
Prerequisite: HIS 250, or permission of instructor.
- HIS 458 Topics in Russian and Soviet Foreign Policy** 2S:M4-6
Examines Tsarist and Soviet foreign relations from the Crimean War to the present with special emphasis on the theme of continuity and change. First term: a colloquium on Russian foreign political behaviour. Second term: discussion of research reports on selected themes. *A. Rossos*.
Prerequisite: HIS 250 or permission of instructor.
- HIS 460 France in America** 2S:W4-6
A comparative study of the societies, institutions, and historical development of the French colonial empire in the Americas down to 1783, with particular reference to Canada. *W.J. Eccles*.
- HIS 462 Regional Societies in Nineteenth Century Canada** 2S:F9-1
Aspects of community development in the regions of Canada. Topics to be studied include: social classes and class relations; social and communal violence; the causes and nature of political protest. *M.S. Cross*.
- HIS 463 Metropolis and Frontier in Canada, 1815-1914** 2S:W4-6
A selective study of the interplay of historical forces stemming from metropolitan centres, inside or outside Canada, and those emanating from frontier areas of basic resource development. The approach is chiefly social and regional, but economic, political and cultural factors are also considered in examining the reciprocal relations between major urban centres and their hinterlands in Canada. *J.M.S. Careless*.
- HIS 464 French-Canadian History II** 2S:N
Seminar course on French Canada. For details consult the Department of History.
- HIS 465 The Roots of English Canada** 2S:T4-6
Comparative studies in the cultural and political origins of English Canada, with first emphasis upon Upper Canada. *G. Patterson*.

- HIS 466 **The Rise of English Canada, 1860-1920** 2S:M4-6
 A study of the development of a distinctive anglophone community emphasizing the myths, illusions, and ideas of English Canadians. A wide variety of topics including nation and region, the urban environment, the growth of professions, social criticism and social reform, politics and leadership, the outside world, culture and nativism.
P. Rutherford.
Exclusion: HIS 366
- HIS 467 **Canadian Foreign Relations in the Twentieth Century** 2S:R8-10p.m.
 This course will look at institutional and ideological aspects of Canadian relations with other countries. Policy-making, including the influence of institutional and public opinion factors, will be considered. Foreign relations will be construed to include investment policies, defence, public opinion and intellectual trends. *R. Bothwell.*
- HIS 468 **Canada in the Second World War** 2S:T2-4
 This course, while dealing in outline with the operations and organization of Canadian forces in 1939-1945, also deals with political and economic aspects of the wartime history of Canada, and with the war's influence on Canada's relations with the Commonwealth and the United States. *C.P. Stacey.*
- HIS 469 **Studies in English Canadian Intellectual History since 1880** (Not offered 1973-74) 2S
 An examination of themes in social, religious, and nationalist thought studied in the broad cultural and social context. *C.C. Berger.*
- NOTE: Students interested in Canadian history should also refer to HIS 412.
- HIS 474 **American Slavery and Its Aftermath** 2S:W9-11
 The institution of slavery, proslavery and antislavery arguments, the free Negro in American society, slavery and the Civil War. Reconstruction, segregation, desegregation; and Black Nationalism. *G.M. Craig.*
- HIS 475S **Social and Intellectual History of the American Colonies** (Not offered 1973-74) 2S
 Selected topics in the intellectual and social history of the British colonies in North America, 1607-1776. Some time devoted to the 17th century but the focus is upon understanding the social structure and cultural life of the colonies in the 18th century. *J.K. Conway.*
- HIS 477 **Nineteenth Century American History** 2S:T4-6
 Course to be offered by a visiting professor. For details, consult the Department of History.
- HIS 478 **Topics in Twentieth Century American Diplomacy** 1L, 1T:T4-6
 An introduction to the major foreign policies of the United States from the 1880's to the present, emphasizing the motivations and patterns of action of policy-makers. Primarily a reading course. *R.D. Accinelli.*
Prerequisite: HIS 270/271/370/372
- HIS 479S **Cold War America** 2S:M4-6
 A comprehensive description and analysis of the political, social and economic institutions and foreign policy commitments of the United States, 1941-1970. *W.C. Berman.*
Prerequisite: HIS 372 or permission of instructor.
- HIS 481 **Twentieth Century China** 2S:N
 A history of the emergence of modern China from 1895 to the present day. *W.G. Saywell.*
- HIS 484 **Selected Topics in Modern Japanese History** 2S:N
 Students who wish to take this seminar should consult *Professor P.L. Thompson* before enrolling.

- HIS 485 The Problem of Government in Classical Greece** (Not offered 1973-74) 2S
The course studies forms and ideas of socio-political organization, concentrating on Athens, from Solon, founder of her democracy, to Pericles, its greatest exponent. The relevant parts of the histories of Herodotus and Thucydides, Aristotle's *Constitution of Athens*, and selections from other works will be read in translation. *J.R. Grant*.
- HIS 486 From Republic to Principate** 2S:N
A revolution of the Right (133 B.C.—A.D. 14). Failure of Roman municipal institutions when extended to government of empire. Problems in administration, security, the economy, and ideology. Search for alternatives. The Augustan settlement as a response to specific challenges. *G.L. Keyes*. (Not offered 1974-75).
- HIS 487F China's Foreign Relations in Transition, 1860-1912** 2S:M2-4
The transition from the "tributary system" of conducting China's inter-state relations to China's participation in the nation-state system of international relations, and the intellectual changes which accompanied it. *J.L. Cranmer-Byng*.
Prerequisite: HIS 380 or permission of instructor.
- HIS 488S Contemporary China's Foreign Relations, 1950 to Present** 2S:M2-4
An examination of the policy and practice of foreign relations under the People's Republic of China. *J.L. Cranmer-Byng*.
Prerequisite: HIS 380 or JMC 300 or permission of instructor.
- NOTE:** Students interested in Chinese history should also refer to HIS 481.
- HIS 491 The Revolutionary Tradition in Mexico and Cuba** 2S:T4-6
An analysis of the emergence in Mexico of a powerful and cohesive 'revolutionary' dependent bourgeoisie over the period 1910-1970. Emphasis will be placed on the role of the intelligentsia, of political entrepreneurs, and on the mechanism of co-optation. The dynamics of socialist development in Cuba will provide a contrasting model of political and social change. *T.M. Brady*.
- HIS 497/498F Independent Studies** N
This course will assume either of two forms: first, the preparation of an undergraduate thesis: or, second, the study of the literature of a special subject. Students wishing to take this course must find an appropriate faculty supervisor, receive approval for the project, and then apply in writing to the Independent Studies Committee. Details may be obtained from the departmental office. Application deadline: 15 June of previous term.
- HIS 499S Independent Studies** N
This course will assume either of two forms: first, the preparation of an undergraduate thesis: or, second, the study of the literature of a special subject. Students wishing to take this course must find an appropriate faculty supervisor, receive approval for the project, and then apply in writing to the Independent Studies Committee. Details may be obtained from the departmental office. Application deadline: 8 December of previous term.

HPS HISTORY AND PHILOSOPHY OF SCIENCE AND TECHNOLOGY

*Given by the Institute for the
History and Philosophy of Science and Technology*

Director: Professor J.W. Abrams
Undergraduate Secretary: Professor M.P. Winsor
Enquiries: 191 College Street (upstairs) (928-5047)

The Institute does not offer an undergraduate programme for specialists. However, because human thought and action are today, as in the past, heavily shaped by science and technology, the study of the history of these fields is a valuable basis for a better understanding of the modern world. The HPS

courses (see also HIS 320) will investigate, as an important question in its own right, the historical development of the peculiar human activities called science and technology. No technical or scientific background is required for the courses whose contents are described below. They have been designed for students interested in the interaction of science and technology with society, not to convey specific technical knowledge to the non-scientist nor to familiarize the scientist with the names of the founders of his field. They are suitable for students of all disciplines.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- HPS 200 History of Scientific Ideas** 2L:MW1, 1T:N
 The evolution of scientific ideas and methods from early times to the present, studied through the works of such men as Galileo, Newton, Darwin and Einstein, and in relation to the societies in which they lived. The historical roots of the nature of modern science will be examined. *T.H. Levere, M.P. Winsor.*
- HPS 201 Technology in Western Society** 2L:TR12, 1T:N
 An historical approach to technical change in Western culture from early times to the present. Emphasis will be on the interaction between technology and society, by a consideration of the relation of technics to science, to education, and to other social institutions. *J.B. Sinclair.*

HYGIENE - See MBL "Microbiology" and PST "Parasitology"

IND INDUSTRIAL ENGINEERING

Given by Members of the Faculty of Applied Science and Engineering

<i>Chairman of Department:</i>	Professor B. Bernholtz
<i>Department Counsellors:</i>	Professor R.W.P. Anderson, Mr. G.R. Comrie
<i>Enquiries:</i>	Old Electrical Building, Room 316 (928-6421)

Industrial Engineering is concerned with the analysis, design, installation and control of integrated systems of "men, machines, materials and money" needed to effectively carry out the activities of an enterprise. It makes use of the methodologies of operational research, management science, information and control science, and human factors engineering to specify, predict and evaluate the performance of these systems. Historically, Industrial Engineering arose in the manufacturing industries. More recently, the increasing need for effective utilization of limited resources has led to the application of the Industrial Engineering approach in such diverse areas as transportation, education and the delivery of health care.

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- IND 301F Operational Research I** 2L, 2T L1:TR1, T1:F2-4, T2:W9-11
 An introduction, using simplified case studies, to the methodology, techniques and applications of operational research.
Exclusion: IND 331S
Prerequisites: MAT 134/135/139/150 & STA 242/252
- IND 302S Operational Research II** 2L, 2T L1:TR1, T1:F2-4, T2:W9-11
 Continuation of IND 301F, with greater emphasis on mathematical techniques.
Exclusion: IND 331S
Prerequisite: IND 301F

- IND 331S Operational Research** 2L:TR11, 2T:W10-12
Processes of model building and solution. Problems of reliability, allocation, queueing, competition, sequencing, and co-ordination. Mathematical techniques of linear and dynamic programming, branch and bound methods, simulation, activity networks, and Markov processes.
Exclusion: IND 301F/302S
Prerequisites: MAT 140/225 & MAT 230/234/235/239/250 & STA 252
- IND 413F Fundamentals of Management Science** 2L:WF11, 1½T:M11-12.30
The course presents the basic principles of decision making. It includes such concepts as the expression of individual choice by indifference curves, the analysis of data by Bayesian inference, the value of accurate information, and the use of cardinal utility to represent aversion to risk. The concepts are illustrated with industrial applications.
Prerequisite: STA 242/252/ECO 220
- IND 414S Applications of Management Science** 2L:WF11, 1½T:M11-12.30
Algebraic procedures are presented for applying decision theory to processes where uncertainty is characterized by multinomial, normal and Poisson distributions. Examples include inspection sampling, equipment replacement and marketing.
Prerequisite: IND 413F
- IND 417F Stochastic Models** 2L:TR10, 1½T:M2-3.30
A course on the analysis of stochastic models in operational research. Review of relevant aspects of probability theory; Poisson processes and renewal processes; queueing models and Markov chains; applications to problems in electronic testing, traffic flows, reliability, inventory, etc.
Prerequisites: STA 252 & MAT 230/234/235/239/244F/250
- IND 418F System Simulation** 2L:T2-4, 1½T:W9-10.30
Computer simulation models. The theory will be developed and applied to problems in the design and analysis of queueing, inventory, maintenance, reliability, transportation, and resource allocation systems.
Prerequisites: STA 242/252 & CSC 108F/108Y/148F/148Y/ECO 222
- IND 419S Information and Optimization** 2L:TR11, 1½T:M3.30-5
Introduction to information theory; topics in optimization theory.
Prerequisites: MAT 140/224F & MAT 230/234/235/239/250
- IND 420S Mathematical Programming** 2L:F9-11, 1½T:M2-3.30
Formulation of the linear programming problem, the simplex method (review), the revised simplex method, duality and the dual simplex method, post-optimality problems, parametric linear programming. Transportation problems, the fixed charge problem. Flows in networks. Integer linear programming-algorithms for the all-integer and the mixed integer-continuous problem. Fractional linear programming. Quadratic programming.
Exclusion: APM 451F
Prerequisites: MAT 140/225 & MAT 230/234/235/239/250
- IND 421F Management Information Systems** 2L:TR11, 2T:M3.30-5
Study of information systems in relation to both operational and decision-making activities in an organization. Models of information systems. The roles of the information analyst and systems designer; managerial and user implications. The development cycle of information processing systems; project control, implementation, and evaluation. Case studies and projects.
Prerequisites: At least two courses in Computer Science and consent of the instructor

Academic Co-ordinator: Mr. D.B. King
Enquiries: 63 St. George Street, Room 201 (928-2511)

The courses offered by Innis College are designed to complement the more traditional courses offered in the Faculty of Arts and Science, and to a large extent they involve experimental methods of presentation.

Innis College courses do not form part of any specialist programmes, but many students concentrating in certain areas of study find that the inclusion of one or two Innis courses in their programme provides some unusual perspectives. For example, a student specializing in Political Science or Sociology will find in INI 206 (Power and Strategy in City Politics) a direct and practical approach to some contemporary political and social problems.

Students interested in the Arts will find the courses in Cinema of value. Quite often students choose the more unstructured courses (e.g. INI 213: Independent Studies) to test their own initiative in determining the direction of their studies in special areas of immediate concern.

While these courses are open to all members of the Faculty of Arts and Science, it may be necessary in some limited enrolment courses to give priority to students enrolled at Innis College. For further information and application procedures please contact the Academic Co-ordinator of the College at 928-2511.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- INI 202 **Canadian Culture and Society** 1L;T6 1T:M1/W1, 1P:N
 An introduction to aspects of Canadian Culture and Society, arranged for students for whom English is a second language. The facilities of the various university Writing Laboratories are available for help in the preparation of required written and oral reports. Limited enrolment. *Mrs. R. Davidson.*
- INI 206 **Power and Strategy in City Politics (Part I)** 2S:W7-9p.m.
 The study of how individuals and certain interest groups relate to various levels of urban political structures in Toronto, ranging from community action groups to the "higher" levels of city government. A heavy emphasis will be placed on direct participation in these interest groups. Eight-month apprenticeships with Aldermen and School Trustees may be arranged. The course frequently meets at City Hall. Limited enrolment. *A.T.R. Powell.*
- INI 207 **The Human Potentiality** 3S:T2-5
 Topics selected from among the following will be explored: the evolution of the movement itself, the psychology of religion, altered states of consciousness, personal identity, and counter-cultural communities. Admission to this course only by permission of the instructor *after* an interview. Limited enrolment.
- INI 208 **Myths and Realities** 2L:T7-9p.m., 1T:N
 This course explores some relationships between rational and nonrational dimensions of our perceptual world. Our primary concern is to explore how various forms of imagery (including art, language and film) affect our belief systems as important expressions of "living" in the sense of supplying models that give and subvert meaning and value to human life. Limited enrolment. *A.M. Bennett.*
- INI 209 **Theory and Practice of Zen** (Not offered 1973-74) 3S
 This course will combine a study of Zen Buddhist theory and practice of some of the elementary stages of zazen or Zen "meditation". Wittgenstein's views on the philosophy of religion, as they apply to Zen, will form part of the theoretical background of the course. Classes will begin with some rounds of zazen. Discussion will include Zen life-style, karma, rebirth, the koan, Zen poetry and art. Limited enrolment. *J.V. Canfield.*

- INI 211 **The Political Structure of Scientific Thought** 2S:T4-6
 Orthodoxy and Revolution of Modern Science. This course examines the influence of science upon contemporary modes of thought, speech and techniques of persuasion. The idea that science has any coherent and identifiable metaphysical basis is discussed and cultural phenomena which present heretical challenges to scientific orthodoxy, notably parapsychology, are considered in relation to various alternative systems of belief. Limited enrolment. *R.C. Plowright.*
- INI 213 **Independent Study (Part I)** 3S:N
 Students enrolled in this course are invited to explore, either individually or in groups, topics of their own choice, and to design their own projects. For guidance and assistance, the College provides a staff of resource persons with a wide variety of skills and backgrounds. Normally the grading in this course is "Pass/Fail", but students may apply for a numerical grade if they so desire. Before registration, students interested in this course are encouraged to discuss their ideas with the current resource staff.
Exclusion: INI (CIN) 203, 303
- INI 214 **Introduction to Film Studies** 2P, 2S P:W4-6, S1:TR11, S2:TR3
 An introduction to film history, major aesthetic approaches and the rudiments of film technology. Limited enrolment. *J. Medjuck.*
Exclusion: Any other introductory film course.
- INI 224 **Filmmakers: The Personal Vision** (Not offered 1973-74) 2L, 2T
 An advanced study concentrating on the work of four major filmmakers. This course is recommended only to students with some previous experience in film studies. *J. Medjuck.* (This course alternates with INI 304)
- INI 240 **Explorations in the Thought of Harold Innis** 2S:N
 The emphasis in this course will be on the connections between Harold Innis's work as an economic historian and his later writings on communications and cultural change. Limited enrolment. *T. Easterbrook.*
Prerequisite: Permission of instructor.
- INI 250 **Dramatic Theory and Practice** 2S:TR11, 3P:N
 This course provides an opportunity for students to explore such topics as staging, movement, characterization, voice and speech, set construction and director's techniques. In addition to the preparation of essays and relevant readings from the works of Stanislavsky, Craig, Brecht, etc., students will be expected to participate in at least one of the workshops and one of the productions sponsored by the Graduate Centre for the Study of Drama. Limited enrolment. *M. Hunter.*
- INI 280 **Women in Film and Literature** 2S:MW4
 A study of cinema and literature by women, in which we will try to find alternatives to conventional critical apparatus, by emphasizing those elements which seem to be unique to women's experience and by examining our own personal responses to creative works by women. Works by such artists as Agnes Varda, Joyce Wielande, Gertrude Stein and Doris Lessing will be included. Limited enrolment; admission through application. *K. Armatage.*

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- INI 300 **Education and Society** 2S:W5-7p.m.
 An analysis of critical problems and issues in education and the contributions of the major disciplines in their resolution. Current educational thought and practice will be emphasized, with particular reference to the Province of Ontario. *G.W. Bancroft.*

- INI 304 **Modern Arts: The Cinema** 2S:MW2, 2P:T4-6
A critical examination of the language, literature and techniques of cinema through a study of the works of a selected number of filmmakers. This course is recommended only to students with some previous experience in film studies. Limited enrolment. *J. Medjuck*. (This course alternates with INI 224)
- INI 306 **Power and Strategy in City Politics (Part II)** 2S:W7-9p.m.
This course will provide for a limited number of students an opportunity to study in greater depth and detail topics which they selected in INI 206. *A. Powell*.
Prerequisite: CIN/INI 206
- INI 313 **Independent Study (Part II)** 3S:N
This course provides an opportunity for further independent study. Students may wish to continue explorations begun in INI 213 (203).
Exclusion: INI 303 (CIN 303)
Prerequisite: INI (CIN) 203 or INI 213

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- INI 400 **Selected Topics in Education** 2S:T5-7p.m.
A course dealing with the relationship of a particular discipline (Political Science, Economics, Psychology, etc.) to the study of education. *J.W. Greig*.
Prerequisite: CIN/INI 300 or INX 302/FSY 301. (Alternatives in Education) or SOC 311.
- INI 413 **Independent Study (Part III)** 3S:N
This course provides a further opportunity for the pursuit of independent studies.
Prerequisite: INI(CIN) 303/313

INL INTERDISCIPLINARY LITERATURE COURSES

Enquiries: 97 St. George Street. Telephone 928-6423

The Interdisciplinary Literature courses are offered by the language departments of the several colleges on the St. George Campus of the University of Toronto and by the Department of Italian and Hispanic studies. Instruction is by specialists in the literatures of various languages and deals with aspects which those literatures have in common.

Students seeking a general introduction to Literature may enrol in INV 103 Introduction to Literature. See description below under "(INV) Victoria College Courses."

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- INL 207 **The Science Fiction Novel** (Not offered 1973-74) 3L
Readings in the Science Fiction Novel from H.G. Wells to the present. *P. Fitting* (French, St. Michael's College).
Exclusion: FSL 207 (1971-72)
- INL 208 **Satiric and Tragic Prose of Social Protest in the 20th Century**
(See INU 208 under "University College Courses")
- INL 216Y **Modern Scandinavian Fiction in Translation** 1L:F1
An introduction to fiction of the last hundred years in Iceland, Denmark, Norway, Sweden, and Finland. Writers studied will include Laxness, Jacobsen, Jensen, Hamsun, Undset, Lagerlof, Sillanpaa. *J.E. Chamberlin* (English, University College).
Exclusion: FSY 216Y (1971-72)

NOTE: The following courses are also open to students in First and Higher Years, and are described below: INL 317, INL 361.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- INL 300 **Twentieth Century Literature** 3L:MWF12
 Selected works, including prose fiction and theatre, by major European and American writers of the Twentieth Century, such as: Brecht, Camus, Conrad, Faulkner, Genet, Hesse, Ionesco, Joyce, Kafka, Mann, Pinter, Sartre, Williams. Works not written in English will be read in translation. *V. Mueller-Carson* (German, St. Michael's College)
Exclusion: FSL 248 (1971-72)
- INL 301 **Contexts of Modern Literature** 3L:MWF12
 Problems of definition, formulation, and method, and analyses of style, structure, and technique in selected works of twentieth century literature by such writers as Bernanos, Borges, Camus, Faulkner, Genet, Joyce, Kafka, and Sartre. Works not written in English will be read in translation. *J.K. Gilbert* (French, New College).
Exclusion: INL 300 (1972-73), FSL 248 (1971-72)
- INL 312 **Contemporary Fiction and its Backgrounds** 3L:MWF11
 Major works of English, European, American, and Latin American fiction since 1945 will be studied in relation to modern innovations in narrative technique and historical traditions of the epic mode. Novels by Nabokov, Mailer, Solzhenitsyn, Robbe-Grillet, Grass, Bellow, Fuentes, Borges, and others. Works not written in English will be read in translation. *C. Hamlin* (English, Victoria College) and *M.J. Valdes* (Italian and Hispanic Studies).
Exclusion: FSL 312 (1971-72)
- INL 317 **The Contemporary Canadian Novel** (Not offered 1973-74) 2P
 Psychological, religious and philosophical problems in novels by Aquin, Carrier, Cohen, Ducharme, Engel, Godbout, Godfrey, Hebert, Langevin, Laurence, Richler, Watson. Special emphasis will be given to the questions of alienation and communication, freedom, sainthood, and the role of religion in the formation of character and world-view. The ideas in each work will always be related to the structural problems faced by the author. *C. Roberts* (French, New College).
Exclusion: FSL 317 (1971-72)
Prerequisite: A reading knowledge of French
- INL 346 **Symbolist Poetry of America, France and England** (Not offered 1973-74) 3L
 An exploration of distinctive patterns of reciprocal influence among symbolist poets in America, France and England during the nineteenth and early twentieth centuries, concentrating on: Poe, Banville, Baudelaire, Swinburne, Mallarmé, Verlaine, Rimbaud, Corbière, Laforgue, Yeats, Symons, Dowson, Valéry, Eliot, Stevens. *E.W. Domville* (English, New College). *P.L. Mathews* (French, New College).
Prerequisite: A reading knowledge of French and permission of either instructor.
- INL 361 **The Self-Portrait of the Jew in French and North American Fiction** 2P:R2-4
 A study of such themes as Jewish Identity and Judaism, Assimilation and Diaspora, Anxiety and Humour, in the works of Romain Gary, Schwartz-Bart, Wiesel, Malamud, Roth, Bellow, Wallant. *F. Gerson* (French, New College).
Exclusion: FSL 361 (1971-72)
Prerequisite: A reading knowledge of French and permission of the instructor.

Enquiries: The Registrar, St. Michael's College (921-3151)

St. Michael's College offers several inter-disciplinary courses, any of which may be included as part of a student's regular programme in Arts and Science. Staff members from different departments participate in the teaching of each of these courses.

Courses in this group include two inter-departmental seminars in Religious Studies and Philosophy. These seminars constitute the core of an inter-departmental specialization programme offered by the Departments of Religious Studies and Philosophy at St. Michael's College, a programme open to any undergraduate at the University of Toronto and allowing him not merely to draw extensively upon the resources of the two different departments but also to be certified as a specialist in the two different disciplines. For detailed information about this programme, please consult the bulletin either of the Combined Departments for Religious Studies or of the St. Michael's College Department of Philosophy.

INM 235Y An Interdisciplinary Study of German Culture (Not offered 1973-74)

A comprehensive and multifaceted study of the German speaking countries of Middle Europe and their relations with and influence on Europe and America. Specialists from various departments will participate in this synoptic description of past and present-day Germany, its environment, history, thought, and art. No knowledge of the German language is required. Co-ordinator: *W. Hempel*.

INM 380 Religious Studies and Philosophy (I)

This inter-departmental seminar is conducted jointly by two instructors, one each from the Departments of Religious Studies and Philosophy at St. Michael's College. The subject of study for the year is a significant thinker, topic, or text that the instructors judge fruitful to examine from the viewpoints of both disciplines. The student is encouraged to develop both an in-depth knowledge of the particular subject and an exact appreciation of the relations in general between Religious Studies and Philosophy.

Prerequisites: three course-equivalents in Religious Studies and three course-equivalents in Philosophy, or permission of the instructors.

INM 480 Religious Studies and Philosophy (II) (Not offered 1973-74)

This inter-departmental seminar is conducted jointly by the same two instructors responsible for INM 380 during the previous year. Basically, each student undertakes independent research and prepares a substantial paper on some topic arising from the previous year's seminar work. Integral to the course, however, are periodic meetings of the group, in which the students report on their individual progress and discuss the insights they have achieved and the problems they are confronting.

Prerequisite: INM 380

COLLEGE COMMUNITY PROGRAMME

Enquiries: The Registrar, Trinity College (928-2687)

Trinity College offers a College course which can be included as a part of a student's regular programme in Arts and Science. What distinguishes this course is that it is taught and organized by a group of Trinity staff-members from a number of different departments and that, in the evening lecture-discussion sessions, they welcome participation by members (students, staff, alumni and others) from all parts of the University Community.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- INT 202 **World Unity—Theory and Practice** 2L, 1T 2L:R7.30-9.30p.m., 1T:N
 There will be a central theme for both terms' work related to man's attempt to establish a unified world society. The lectures in the first term will deal with the problem historically and philosophically, presenting both the theory and practice of internationalism in various contexts. The second term will look at the problem from the twentieth century perspective with special attention to such organisations as the League of Nations, the United Nations, the European Economic Community, etc. Dr. George Ignatieff, Provost of the College, will co-ordinate and participate in the work of the second term.

INDEPENDENT STUDIES PROGRAMME

Enquiries: Programme Director, Trinity College, Room 301 (928-2886) (Until 30 June)
 Room 308 (928-3057) (After 1 July)

Trinity College offers an Independent Studies Programme which gives students the opportunity to explore, in depth, subjects of vital interest which are not part of the present curriculum. It is possible, for example, to cross disciplines; a project devoted to Canadian Government might involve political science, economics, history, sociology, languages. Students who enrol in this Programme will devote two- to three-fifths of their time to the Programme and take two or three regular courses as well. They work closely with at least one professor, a supervisor with the background necessary to oversee their research. In addition, a faculty adviser provides general academic counsel. The projects result in appropriate reports which are evaluated jointly by the student, the professor(s) with whom he has worked, and an outside examiner.

Applications for admission to the Independent Studies Programme will be received from Trinity students in all years. Although application is for one year only, it may be possible to reapply for a second year. Admission procedure includes enrolment at Trinity College and submission to the Director of the Independent Studies Programme of a project proposal, at least two letters of recommendation from people familiar with the student's potential for independent study, and the student's academic record. In preparing their applications, students should consult with Professor J. Levenson, Director (until June 30) or Professor B. Alton, Acting Director (after July 1).

Students who enrol for one year register for INT 401 and INT 402, or for INT 401, INT 402 and INT 403. Those who apply for a second year register for INT 404 and INT 405, or for INT 404, INT 405 and INT 406.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- INT 401 **Trinity Independent Studies** N
Co-requisite: INT 402
- INT 402 **Trinity Independent Studies** N
Co-requisite: INT 401
- INT 403 **Trinity Independent Studies** N
Co-requisite: INT 402

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- INT 404 **Trinity Independent Studies** N
Prerequisites: INT 401, INT 402
Co-requisite: INT 405
- INT 405 **Trinity Independent Studies** N
Prerequisites: INT 401, INT 402
Co-requisite: INT 404

INT 406 **Trinity Independent Studies** N
Prerequisites: INT 401, INT 402
Co-requisite: INT 405

INU**UNIVERSITY COLLEGE COURSES**

Programme Director: Professor H.J. Mason
Enquiries: Dept. of Classics, University College
 (928-3178)

University College's courses for 1973-74 and subsequent years are concerned with "the Humanities and their relation to other disciplines." These are interdisciplinary courses in the sense that they cross traditional departmental boundaries and attempt to draw together a body of knowledge in a form not readily available; they are taught by members of the college who work from their areas of specialized knowledge towards a synthesis with concepts and methods in other areas.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- INU 202S **The Poetry of Physics & the Physics of Poetry** (Formerly FSY 302S/INX 305S) 2S:M4-6
 The course attempts to remedy an alienation people feel from the physical sciences first by providing a non-mathematical description of physics so that the student will come to appreciate the content and beauty of the ideas of Physics; the Poetry of Physics. The second part of the course aims to understand the nature of science and the role it plays in shaping both our thinking and the structure of our society. This aspect is achieved by studying literature as influenced by physical thought. *R.K. Logan, (co-ordinator)*
- INU 208 **Satiric and Tragic Prose of Social Protest** (Formerly INL 208) 3L:MWF11
 Satire and Tragedy in the 20th Century are compared as forms of protest against social and political injustice. The satiric outlook of black humour and the grotesque is contrasted with the quest of tragic fiction for ethical principles that transcend despair. Authors studied include Zamiatyn, Waugh, Brecht, Vonnegut, and Döblin, Paton, Solzhenitsyn, Steinbeck. *D.A. Myers.*
- INU 215 **The Individual and Society** (Formerly GRH 215) 2S:M4-6
 A contemporary problem in an ancient context. The problem in its current form will be studied through the medium of modern treatment, and the course will investigate in detail those ancient writings which framed the question and provided the basis for Western thought on the subject. *A.E. Samuel.*
- INU 225 **Bilingualism** (Formerly GRH 225) 2S:TR3
 The question of language groups coming into contact, especially in politically unified communities. Institutional, linguistic, political, sociological and other effects of bilingualism. Private and Official bilingualism. Special emphasis on the situation of Greek in classical Rome, and of French and English in contemporary Canada. Knowledge of a language other than English will be an asset. *H.J. Mason.*
- INU 240 **Understanding Quebec** (Formerly FSQ 200/INX 240) 2S:M4-6
 This course is intended to introduce the student to a variety of areas of study dealing with Quebec and its people. Included will be aspects of the historical background of French Canada since 1900, literature, music and visual arts (including the cinema, folk music and folk arts) of Quebec. The stress will be on contemporary Quebec society and its artistic expression. A reading knowledge of French is required. *B.-Z. Shek.*
 (Offered in alternate years.)

- INU 340 **Quebec Society and Culture** (Formerly INX 340) (Not offered 1973–1974) 2L, 1T
 Sequel to INU 240 (as FSQ 200) with particular emphasis on history, the social sciences, and literature. Students and instructors will examine a number of important phenomena in contemporary Quebec society and their cultural expression. Students in this course must be able to read French. *B.-Z. Shek.*
Prerequisite: one of INU 240/FRE 142/HIS 362/HIS 464/SOC 102/SOC 303.

INV**VICTORIA COLLEGE COURSES**

Co-ordinator: Principal J.M. Robson
Enquiries: New Academic Building, Victoria College
 (928-3806)

Victoria College offers the interdisciplinary courses listed below so that students, especially in their earlier years, will have an opportunity to examine important themes and problems of our culture from a variety of points of view. Each of the courses serves to introduce ideas and methods from various disciplines; in this way students can use one course to explore areas of interest that they otherwise might overlook, and also gain insight into comparative studies.

The courses are designed, then, to serve the interests of those who, knowing what areas they wish to specialize in, wish to vary their programmes and also the interests of those who have not decided on a discipline, and wish to examine different approaches to humane studies.

Many of the faculty of Victoria, from all its Departments, are contributing to these courses, so there will be more faculty-student contact than is possible in a one-instructor course.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- INV 100 **The Canadian Consciousness** 2L:TR3, 1T:N
 An introduction to the problem of Canadian self-awareness. The course will study the elements underlying the Canadian consciousness—the physical environment, the peoples, languages, social structures—and the search which has been undertaken for it in politics, philosophy, religion, literature, and the arts. *G.S. French.*
- INV 101 **Communication and Persuasion** 2L, 1T:MWF9
 Designed to introduce students to problems of verbal communication in such areas as the humanities, the social sciences, the natural sciences, the media, and in private situations, the course will survey historical attitudes and modes, compare contemporary examples such as the essay, the article, the lecture, the book, propaganda, etc., and include practical exercises in preparing materials for presentation. *J.M. Robson.*
- INV 102 **Turning Points in History** 2L:TR9, 1T:N
 A study of the meaning and significance of certain developments, or ideas, of Near Eastern and Classical antiquity which transformed, are transforming, and will continue to transform human life: e.g., commitment to civilization; participatory democracy; communism, or the planned society; religion as a force for social justice; individualism vs. the corporate ideal; Christianity; the World State. *E.G. Clarke.*
- INV 103 **Introduction to Literature** 2L, 1T:MWF10
 An examination of the central modes and themes of the Western literary tradition. Representative masterworks will be studied from the Classics (Homer, Sophocles, Vergil and Horace) and from the major European literatures (Dante, Shakespeare, Cervantes, Goethe, Wordsworth, Flaubert, Dostoevsky and others). All texts are read in English. This course is open to all students at the university interested in a general introduction to literature. *C. Hamlin.*

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- INV 200 **Reason and Unreason** 2L:R4-6, 1T:N
Contemporary and historical views of reason and unreason, their relation to each other and the limitations of each will be examined in literary, philosophical, religious, and other texts. The following issues are among those to be discussed: whether reason or emotion is the best guide to action; how reason is limited as a mode of knowledge; in what sense imagination or faith or immediate sensuous apprehension is a mode of knowledge; the place of the daemonic in creation; the relation between consciousness, the unconscious and civilization. Open to First-Year students by permission of the instructor. *A. Rosenberg.*
- INV 201 **Renaissance Culture** 2L:TR3, 1T:N
A survey of developments and discoveries in the arts, in thought, and in science during the Renaissance period in Italy and Northern Europe, concentrating mainly on their impact on literature and the visual arts. Illustrated lectures will be given by different specialists, and students will be asked to study such representative figures as Leonardo da Vinci, Erasmus, Thomas More, and Montaigne. Open to First-Year students. *H.R. Secor, E.R. Harvey.*
- INV 202 **Introduction to Cinema** 1L:T11, T1:R11, T2:R3, 2P:W4-6
An introductory survey of the historical development of the dramatic motion picture. Beginning with a discussion of perception and the aesthetic experience, the course considers the development of technique, style and major critical approaches. Representative feature films from 1900 to the 60's will be viewed once a week. *C.D.E. Tolton*
Exclusion: INI 204 & 214
- INV 300 **The Bible and English Literature** (Formerly JER 370) (Not offered 1973-74) 2L, 1T
A study of the way in which writers in English have used Biblical symbols, themes and narratives. Attention is given to the place each symbol, theme and narrative has in the Biblical setting as well as the various interpretations of the material found in selected works from Old English writers (studied in translation) to contemporary authors. Examples of works and authors that might be studied are mediaeval Biblical drama, Old and Middle English lyric and narrative poems, Spenser, Donne, Herbert, Crashaw, Milton, Dryden, Pope, Blake, Melville, Browning, Eliot, Auden, A.M. Klein.
Prerequisite: One course in ENG is recommended.
- INV 302 **Problems of Realism in American Film** (Not offered 1973-74) 2P, 2T
The dramatic motion picture is commonly approached and judged in terms of its reproduction or recreation of reality. However, among film makers and the viewing audience notions of what constitutes a realistic film continually change. After a review of the psychology of perception, this course will investigate changing styles in the criteria of realism and the limitations of the medium in achieving realistic presentations within the context of directorial style. Selected films by Howard Hawks, John Ford, Fritz Lang, and Elia Kazan will be studied along with miscellaneous critical landmarks.
Prerequisite: INI 214 or a previous course in film.

INX

INTERDISCIPLINARY STUDIES

Academic Co-ordinator:
Enquiries:

Professor A.M. Wall
97 St. George St. 3rd floor (928-6423)

“Interdisciplinary Studies” is the name given to a special programme of courses administered by the Faculty of Arts and Science. These courses are in subjects which, because of their innovative character, might not readily be accommodated within the programmes of the regular academic departments of the Faculty.

The "INX" Environmental Studies courses are offered in association with the Institute of Environmental Sciences and Engineering. These courses are given by teams of teachers from various disciplines including botany, economics, hydrology, law, and zoology. The Co-ordinator for all "INX" Environmental Studies courses is Professor Malcolm Telford of the Department of Zoology (928-4843).

Among the other subject areas in Interdisciplinary Studies are: Alternatives in Education, Communications, Community Involvement, Interliterary Studies (see under "INL Interdisciplinary Literature Courses"), Modernization and Community, Women's Studies.

In addition, special seminar courses called "Symposia" are given by Interdisciplinary Studies. A "Symposium" is a course for academic credit which is generated in response to the initiative of a group of students and teachers who wish to engage in the study of some area not listed in the Calendar. Any such group should apply to the Interdisciplinary Studies Office for suggestions concerning the procedure for mounting Symposia.

Interdisciplinary Studies courses are open to qualified students in Arts and Science and in all other Faculties of the University of Toronto.

Because Interdisciplinary Studies is an evolving programme, students are advised to ask for the latest information concerning courses by telephoning 928-6423 or writing to Interdisciplinary Studies, 97 St. George Street, University of Toronto, Toronto M5S 1A1, Ontario.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

INX 200 **Interdisciplinary Symposium**

An "Interdisciplinary Symposium" is a course put together on the initiative of a group of students and teachers who, in the opening weeks of term, get together and prepare a proposal for study in some area of inquiry not listed in the Calendar. They may apply to Interdisciplinary Studies to have their proposal accepted as a regular academic credit. Written applications from such groups must be received in the Interdisciplinary Studies Office not later than September 28, 1973. There are no prerequisites and no co-requisites for an INX 200 Symposium.

NOTE: Students must *not* pre-register for INX 200 Symposia. Each student should draw up a full programme of courses and then either transfer from one of them to INX 200 if his proposal is accredited, or add it as a sixth course. Proposers of INX 200 Symposia should consult with the Chairman of Interdisciplinary Studies at the earliest opportunity.

Exclusion: INX 300 in 1973-74

INX 210 **Communications: Theory and Practice**

2L:T4-6, 1T:N

The aim of this course is to sensitize the participants to both facts and theories of communication in its many forms. Emphasis will be placed on communication among humans: models of communication, perversion and failure of communication, zoo-semiotics, gestures and object systems, the performing arts. *P. Bouissac* (French, Victoria College).

Exclusion: FSC 200 (1971-72), INX 310 (1972-73)

Suggested prior course: JAL 100

INX 220 **Environmental Issues**

2L:T4-6, 1T:N

A multidisciplinary approach to contemporary environmental problems and the related social and economic problems. Discussion will center on such topics as: the need for continued growth in the population and the economy; the responsibilities of scientists, politicians and the layman; the cultural origins of the environmental crisis; moral dilemmas in resolving the crisis. Most of the course is presented in a multi-media tutorial form; hours of study are arranged individually. The lecture time will be used for invited speakers, movies and discussion. *M. Telford* (Zoology and Institute of Environmental Sciences and Engineering).

Exclusion: FSE 200 (1971-72)

- INX 230 **Modernization and Community** 2L:F11-1, 2T:N
 An interdisciplinary approach to two central aspects of modern society: disruptive social changes and their relationship to the cohesion of communities. The central theme of the lectures will be how various forces such as urbanization, industrialization, the rise of modern bureaucracies, and increases in the scale of society transform the traditional community. *A. Rotstein* (Political Economy).
Exclusion: FSM 200 (1971-72)
Co-requisite: One course in ANT/ECO/GGR/HIS/POL/SOC
- INX 240 **Understanding Quebec**
 (See INU 240 under University College Courses)
- INX 250 **Life on other Worlds** 2L:W7.30-9.30p.m.
 A study of the evolution of the solar system and life. This includes a review of current ideas concerning the origin and evolution of the Solar System as well as the geography and atmospheric composition of the planets as revealed by space probes. The periodic properties of matter will be reviewed, with specific reference to living processes, and the physics of structure, motility and transport of living organisms will be discussed—in particular how factors such as gravitation, atmospheric conditions and geography determine and limit the possibilities of life on other worlds. *P. Kronberg* (Astronomy).
- INX 260 **Women: Oppression and Liberation** 2L:W7.30-9.30p.m., 1T:N
 The aim of this course is to develop an understanding of the position of women in Canada today. Women and the media, the family, sexuality, the workforce and revolution, will be studied in historical, cross-cultural, and contemporary contexts. *R. McEwan*.
Exclusion: FSW 200 (1971-72)
- INX 271 **The Idea of a Child** 2L L1:M4-6, L2:M7.30-9.30p.m.
 A study of how various societies, past and present, have regarded their children. We will look at children's status in law and tradition; their socialization—education, sex-typing, psychological development, etc.; and their portrayal in literature. *A. Lukacs*.
- INX 302 **Alternatives in Education**
- INX 310 **Special Systems in Communications**
 (These courses are described in the section which follows.)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- INX 300 **Interdisciplinary Symposium** N
 Procedures for setting up and joining an INX 300 Symposium are the same as those for an INX 200 Symposium (see above). An INX 300 Symposium, however, has at least one prerequisite or co-requisite specified in the proposal brought by its originators to Interdisciplinary Studies for accrediting. Written applications for accrediting such proposals must be received in the Interdisciplinary Studies Office not later than September 28, 1973.
Exclusion: INX 200 (in 1973-74)
Prerequisites and Co-requisites: at least one, as laid down in the proposal for each separate INX 300 Symposium.
- INX 302 **Alternatives in Education** 2L L1:T6-8p.m., L2:T8-10p.m., L3:R8-10p.m., L4:
 F10-12, L5:N
 This course will consist of individual field projects and weekly seminars in order to provide for theoretical and active explorations in the field of education. While groups meet to discuss and evaluate the existing school system and the variety of alternatives, individuals can focus on the area that most interests them. *D. Leckie*.
Exclusion: FSY 301 (in 1972-72)

INX 310 **Special Systems in Communications** (Not offered 1973-74) 2L, 1T
 Topics will include some of the following: gesture language, formal languages, the language of science, languages of intercultural communication, languages of persuasion, structure of narrative and myth. Each student will choose a specific topic upon which to concentrate. A final report or essay on this topic will be required. *B. Brainerd* (Mathematics).

Exclusion: FSC 300 (1971-72)

Prerequisite: FSC 200 (1971-72)

INX 320 **Environment and Society** 2L:M4-6, 1T:N
 A series of lectures, seminars and workshops concerned with major problems arising from man's interaction with his environment. Problems to be studied will include those arising from urbanization as well as those involving pollution and natural resources. Student participation and initiative in selecting problems for consideration is expected. Comprehensive reports on reading and other studies undertaken will be required. *M. Telford* (Zoology and Institute of Environmental Sciences and Engineering).

Exclusion: FSE 300 (1971-72)

Prerequisite: One of: INX 220/GGR 101/ZOO 200/ZOO 223/BOT 230

INX 350 **Understanding the Sciences**

INX 361S **Women's Role in Canadian History**

INX 362F **Archetypes of Women in Fiction**

INX 363F **Women and the Family**

(These courses are described in the section which follows.)

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

INX 331 **Workshop in Community Involvement** 2L L1:M4-6, L2:M8-10p.m., L3:T8-10p.m.
 Projects in the city with resource persons. The combination of fieldwork and seminars is designed to overcome the massive split between theory and practice in attempts at social understanding. This course is open to students who have completed two years of full-time study in any faculty. *J. Lemon* (Geography).

Exclusion: FSM 301 (1971-72), INI 206

INX 340 **Quebec Society and Culture**
 (See INV 340 under "University College Courses")

INX 350 **Understanding the Sciences** 2S:T4-6
 This course is designed to meet the needs and interests of students in the natural and social sciences that are not met within the ordinary courses in their own disciplines. Topics include: scientific explanation; whether or not theories and laws can be said to be true or are merely "models" of reality; the nature of inference from past to future, from observed to unobserved, (inductive inference); confirmation theory; the possibility of reducing one science to another (e.g., Psychology or Sociology to Physics); the possibility of a value-free science; the view of man presupposed in certain scientific approaches (e.g., Behaviourism). *J. Bookbinder*.

Exclusion: FST 300 (in 1971-72)

Prerequisite: Two courses in a natural and/or a social science. PHL 100/101/102/150 strongly recommended.

- INX 361S **Women's Role in Canadian History** 2L:T4-6
 The aim of this course is to pursue an understanding of the role women have played in the development of this country. We will be studying this problem beginning with the migration of the Indian and Inuit peoples and ending with the close of World War II. Much first-hand material will be incorporated as part of our study. *R. McEwan.*
Prerequisite: FSW 200/INX 260 or permission of the instructor
- INX 362F **Archetypes of Women in Fiction** 2L:W4-6
 The emphasis of this course will be on the delineation of feminine archetypes in Western literature including a study of their function in Canadian novels. Of particular interest will be the investigation of such archetypes as the fallen woman, the temptress and the virgin. *M. Kostash.*
Prerequisite: INX 260/FSW 200 or permission of the instructor
- INX 363F **Women and the Family** 2L:W4-6
 This course will examine and compare the division of labour and sex role behaviour of women in western European and certain non-Western societies. Emphasis will be on the position of women in the family in the twentieth century—the effects of industrialization and growth of imperialism. Material will be drawn from the social sciences, contemporary literature, and history. *Margaret Luxton.*
Prerequisite: FSW 200/INX 260 or permission of the instructor.

- INX 420 **Environmental Research Seminar** 2P, 2T:N
 A special course of study available to a small number of students specializing in environmental problems. This course is given in collaboration with the Institute of Environmental Sciences and Engineering. Interested students must contact Professor Telford not later than August 15, 1973. *M. Telford* (Zoology and Institute of Environmental Sciences and Engineering).
Prerequisite: INX 320

COURSES OPEN TO FOURTH-YEAR STUDENTS

- INX 430 **Special Topics in Modernization and Community** 2L:W5.30-7.30p.m., 8P:N
 Individual or team research projects, ordinarily continuations of work done in INX 331. *J. Lemon* (Geography).
Prerequisite: INX 331
- INX 431 **Urban Issues through Community Involvement** 2L, 8P:N
 The students assume responsibility for structuring their own learning experience by (a) initiating their own involvement (in consultation with course leaders) in some aspect of urban social action, and (b) communicating and reflecting upon this involvement at weekly group seminars, and (c) written reports and evaluation. The course includes field trips, reconnaissance, and resource persons. *J. Metson.*
Prerequisite: INX 331
- INX 450 **Problems of Interdisciplinary Research** 2S:N
 Individual study on problems surrounding the origin and implementation of practical policies in the natural and social sciences. Tutorials on value theory and other topics will be offered, and are intended to help the student in producing a written report on his research. Each student will work closely with a supervisor. *D. Pokorny* (*Political Economy*)
Exclusion: FST 400 (in 1971-72)
Prerequisite: INX 350

<i>Chairman of Department:</i>	Professor R.M. Savory
<i>Undergraduate Secretary:</i>	Professor R. Sandler
<i>Enquiries:</i>	455 Spadina Ave., Room 401 (928-3307)

The discipline of Islamic Studies is concerned with the total culture and civilization of the Islamic world from the advent of Islam in the 7th century A.D. up to the present day. By "Islamic world" is meant those regions where Islam is, or was, the dominant religion. It is therefore not limited to the Middle East, but includes areas as far apart as North Africa and Spain on the one hand, and China, Malaya and Indonesia on the other. Today, about 450,000,000 people call themselves Muslims. The study of Islamic civilization thus introduces the student to the culture of about one-sixth of the total population of the world.

The discipline of Islamic Studies is concerned with the study of the literature, history, religion, philosophy, thought, art and architecture of the Islamic world as defined above. Because languages are the key to the understanding of any culture, courses are offered in the principal languages of Islam: Arabic, Persian, and Turkish. In addition, Urdu is available at the graduate level. Of these, Arabic is the most important; Arabia was the birthplace of Islam, and Arabic is the language of the Qur'an, the revealed scriptures of Islam. Today, Arabic is the common language of people from Morocco to the borders of Persia, and from Syria to the Sudan. But Muslims speaking and writing Persian, Turkish or Urdu have, through the centuries, made a vital contribution to that unique cultural achievement which we call Islamic civilization.

The discipline of Islamic Studies is conceived in the broad tradition of the humanities. Its special appeal is that it affords the student the opportunity of studying a non-Western civilization. No longer can the West be content to ignore, or to have only vague and prejudicious ideas about, a substantial proportion of mankind. It follows that the civilization of Islam merits study for its own sake.

There are many careers open to students in Islamic Studies. These include: university teaching; specialist Islamic librarianship (for those qualified in both Islamic Studies and Library Science); public administration; business; high school teaching; Islamic art and archaeology (usually connected with work in museums); journalism, and bibliographical work. Undergraduate courses offered by the Department of Islamic Studies are accepted by The Faculty of Education as History credits towards Type A eligibility in History.

At the graduate level opportunities for advanced study are also provided, and graduate students are encouraged to take courses in other departments and centres in addition to courses specifically related to Islamic Studies. Such departments and centres include the Centre for Medieval Studies, the Centre for Linguistics, the International Studies Programme, the Department of Philosophy, the Pontifical Institute for Medieval Studies, and the Centre for Russian and East European Studies. There are many areas of research in which fruitful co-operation is possible between the discipline of Islamic Studies and other disciplines: for example, with Hispanic Studies, for the study of Islamic civilization in Spain; with Medieval Philosophy and Classics, for the influence of neo-Platonism on the Muslim scholastic theologians and political philosophers, to name but one possible area; with History, for the study of those periods during which there was close contact between Islam and Christendom, for instance, the Crusades, the Mongol invasions of western Asia and eastern Europe, and the 600 years of the Ottoman Empire; and with International Studies, for the study of political and social developments in the modern Islamic world. For the linguist, the philosopher, the historian, the social scientist, and the student of comparative literature, the interaction between the two civilizations affords stimulating comparisons. Students should have these opportunities in mind when selecting the courses in their undergraduate programmes.

The undergraduate programme for students seeking to specialize in Islamic Studies is distinguished primarily by its insistence on real competence in at least one Islamic language. A student intending to proceed to graduate work in this discipline is urged to study a second Islamic language, but this is not mandatory. At the same time, no proper understanding of Islamic civilization can be achieved without a thorough knowledge of Islamic history.

The Islamic Studies Programme is defined as a minimum of nine courses in Islamic Studies, of which at least three shall be language courses. A wide variety of options is offered in each year. Students

who intend to enrol in this programme are urged to contact the Undergraduate Secretary of the Department of Islamic Studies as soon as possible, and in any case not later than the end of their First Year, so that the options which best suit their interests and needs may be selected. The number of prerequisites for courses has been kept to a minimum, but the sequential nature of language teaching requires that a less advanced language course will normally be the prerequisite for a more advanced language course.

During the September registration period the Department distributes a leaflet concerning its course offerings.

NOTE: **ISL 214 Introductory Standard Arabic** may be taken in First Year, and students, particularly those intending to follow the programme in Islamic Studies, are encouraged to do so.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

ISL 105S Survey of Islamic Art (Not offered 1973-74) 2L
The art and archaeology of the Islamic world, from Spain to India, from the Arab conquests of the 7th century A.D. up to the 18th century. The course includes tutorials and museum study.

NOTE: The following courses, described in the section below, are also open to First-Year students: ISL 200, 207F, 208S, 213, 214, 215, 216.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

ISL 200 The Historical Development of the Islamic World 2L:W7-9p.m.
This course traces the historical development of the Islamic World from its beginnings to the present day. Particular attention is given to the contributions of the various cultures and ethnic groups which entered this world and continue to exist within a general Islamic framework.

ISL 201F Muhammad and the Rise of the Islamic Empire to 861 A.D. 2S:TR1
The course describes those features of pre-Islamic Arabia inherited by Islam, and examines the life, times and teachings of Muhammad in some detail. It continues with the political, administrative and cultural history of the Orthodox Caliphate, the Umayyads and the early 'Abbasids. The early intellectual and religious movements in Islam, and the first Muslim sects, are also discussed.

ISL 202F Islam v. Christendom: the Crusades 2S:WF1
This course offers a survey of the Crusades, largely from the point of view of Islamic history. Stress is thus laid on the Islamic response to the Crusades on a variety of levels—military, political and cultural.

ISL 203F The Islamic Empire in Decline (861-1258 A.D.) 2S:TR1
The assassination of al-Mutawakkil in 861 led to the decline of the institution of the Caliphate, and resulted in the rise of the Turks and of autonomous provincial dynasties. Nevertheless this period witnessed the highest development of Islamic culture, and its political, economic and social factors are analysed. The course concludes with the coming of the Mongols in 1258.
Recommended preparation: ISL 200/201F

ISL 206S Cultural Attitudes in the Islamic World 2L:T4-6
This course examines the attitudes of a wide spectrum of Middle Eastern society, at different periods, on a variety of subjects including political authority, the family, the place of women, the individual and society, Western civilization. Attention is given to changing attitudes in the modern Islamic World.

- ISL 207F **Mediaeval Arabic Literature in Translation** 2S:TR11
 This course, an introduction to the mediaeval Arabic literary heritage, begins with the study of representative Arabic poems of the pre-Islamic period, then of certain aspects of the *Qur'ān*. It then traces the development of lyric poetry in the Islamic period and of prose, with emphasis on narrative prose.
- ISL 208S **Arabic Literature in North America** (in translation) (Formerly ISL 217F) 2L:TR2
 A study of the Arabic literary movement in North America in the 20th century, with emphasis on the most important and popular Arab-American authors: Gibran, Nu'aymah, Abu Madi, 'Aridah, Nadrah Haddād, Ayyub, etc.
- ISL 213 **An Historical Introduction to Islamic Civilization** 2L:TR12
 This course explains the essential beliefs and practices of Islam and the development of its intellectual and mystical traditions within the historical context of the spread of Islam. The Muslim encounter with the Byzantine and Persian empires, and later with the Turks and Mongols, is also examined. Emphasis is given to the Islamic contribution to world civilization in the past and its continuing impact today.
- ISL 214 **Introductory Standard Arabic** 3S:MWF3, 1P:T3
 In this course the student is introduced to the structure of Standard Arabic, neither obviously "classical" nor markedly "modern" in character. Native speakers of Arabic are not eligible to enrol in this course.
- ISL 215 **Introductory Persian** 3L:MTW11, 1P:F11
 This course covers the fundamentals of Persian grammar and syntax, and enables the student to read a variety of simple texts in modern Persian. At least one hour a week of language laboratory work is mandatory. Native speakers of Persian are not admissible to this course.
- ISL 216 **Introductory Turkish** 3L:MWF10, 1P:T9
 The basic features of Modern Turkish grammar and syntax are studied in the First Term. By the beginning of the Second Term, the student is already reading Turkish prose; at the end of the course, he should be able to read ordinary modern texts, such as appear in newspapers, with the aid of a dictionary, and to write simple Turkish. Native speakers of Turkish are not admissible to this course.
- ISL 220 **Intermediate Standard Arabic** 3L:T7-9.30p.m., 2P:N
 This course concentrates on the reading of simple, connected prose passages that typify normal patterns of Arabic syntax, and that increase the student's working vocabulary in a proper context. More literary and idiomatic passages are introduced gradually, enabling the student to develop a feel for the language. Native speakers of Arabic are not eligible to enrol in this course.
Prerequisite: ISL 214
- ISL 300 **The Ottoman Empire and Modern Turkey** 2S:TR10
 This course deals with the history of Ottoman expansion from the beginning of Suleyman the Magnificent's reign, the disintegration of the empire and the formation of the Turkish republic. It will provide a solid contribution to understanding the shaping of modern Europe, the Balkans and the Arab world.
- ISL 301F **The Mughal Empire, Islam in British India, Pakistan** 2S:MW1
 After a brief survey of the early history of the Muslim presence in India, the course concentrates in detail on the political, administrative, social and intellectual history of the Mughal Empire. It deals with the situation and problems of the Muslim community in India under the East India Company and in the British Indian Empire. It concludes with a discussion of the Pakistan movement, and an outline of the political and economic history of Pakistan.

- ISL 302F **The Modern Arab World** 2S:R7-9p.m.
A survey and critical analysis of the political, economic and social aspects of the history of the Arab World, from the conquest of Syria and Egypt by the Ottoman Turks (1516-17) to the present.
- ISL 303F **The Mongol Invasions: Tatar Yoke or *Pax Mongolica*?** (Not offered 1973-74)2S
The establishment of the Mongol "universal empire", for a brief period united the East and the West in a manner unique in history. This course traces the rise and fall of the Mongol power.
- ISL 304S **Great Power Rivalry in Iran** (Not offered in 1973-74) 2S
Although Iran was never officially a colony of any of the Great Powers, it was dominated by them from the beginning of the 19th century onwards. This course traces the course of Russian, British, French, German and American involvement in Iran during the 19th and 20th centuries.
- ISL 305S **The Rise and Development of the Ottoman Empire to 1520** 2S:R7-9p.m.
A study of the origins of the Ottoman dynasty, and of its evolution from a Turkish border principality into an imposing empire straddling three continents. Emphasis is given to Ottoman expansion in Europe, Asia and North Africa, the growth of important military and administrative institutions, and the Islamization of Asia Minor.
- ISL 310 **Sufism: Mysticism in Islam** 2S:TR2
This course deals with the teachings and practices of the mystics in Islam, known as Sufis. The doctrines and disciplines of selected Sufi teachers, and their influence on the development of Islamic civilization, will be examined.

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- ISL 311 **The Material Culture of Islam** 2L:MW10
This involves an investigation (in greater depth than in ISL 105S) of Islamic culture and society, based on the evidence of art and archaeology, from the 7th to the 18th century A.D. It is designed primarily for those who are specializing in either Islamic Studies or Fine Art.
Prerequisite: One course in ISL or FAR
- ISL 312S **Islamic Theology and Philosophy** 2S:M7-9p.m.
This course traces the development of mediaeval Islamic theology (*kalām*) and philosophy (*falsafa*), showing how these represent two divergent views of God and creation. It involves examining the metaphysics of such philosophers as Kindi, Alfarabi and Avicenna, Ghazali's occasionalist critique of the concept of causal necessity, and Averroes' Aristotelian defense of philosophy. It also discusses the relation of metaphysics to political theory in the writings of Alfarabi and his successors.
- ISL 321 **Advanced Standard Arabic I** 3S:MWF11
The study of connected passages of literary Arabic from both classical and modern times is undertaken at this stage, with slightly more emphasis being placed on the modern period. Exercises in grammar and composition are prescribed in coordination with the reading material. Oral comprehension is also stressed. Native speakers of Arabic wishing to enrol in this course must first receive departmental approval.
Prerequisite: ISL 220

- ISL 322 **Intermediate Persian** 3S:MWF12
 This course is designed to introduce students to several of the easier genres of Persian prose and poetry, both classical and modern. The short prose selections include belles-lettres, short stories, etc., as well as some historical writing. The poetry selections include brief samples of lyrics and odes of two major classical poets and a passage from the national epic, together with specimens of the work of contemporary poets. Native speakers of Persian are not normally eligible to enrol in this course.
Prerequisite: ISL 215
- ISL 323 **Intermediate Turkish** 3S:MWF3
 Wide reading of selected modern texts—literary, scholarly and journalistic—covering a variety of subjects, and in a broad range of styles, will consolidate and develop the student’s knowledge of Turkish grammar and syntax, and afford him some understanding of the nature of Turkish culture. The course includes an introduction to Ottoman Turkish, the literary language of the Ottoman Empire from the 14th to the early 20th centuries. Native speakers of Turkish are not normally eligible to enrol in this course.
Prerequisite: ISL 216
- ISL 325 **Colloquial Arabic I** (Not offered 1973-74) 3S
 This course offers an introduction to the spoken Egyptian dialect of Cairo. The grammar and structure of the language are examined with emphasis on oral drills. Native speakers of Arabic are not eligible to enrol in this course.
- ISL 410 **Seminar on Aspects of Sufism** 2S:R4-6
Prerequisite: ISL 310
- ISL 425 **Advanced Standard Arabic II** 3S:MWF11
 This course, which is an extension of the third-year course, is devoted mainly to a thorough study of selected passages from advanced literary Arabic of both the classical and modern periods. Exercises in composition and oral comprehension are continued on a more advanced level. Native speakers of Arabic wishing to enrol in this course must first receive departmental approval.
Prerequisite: ISL 321
- ISL 426 **Advanced Persian** (Not offered 1973-74) 3S
 This course follows the general pattern of ISL 322, but the passages chosen are longer and more sophisticated and give a firmer grasp of the “attitudes” of Persian literature. In particular, while creative prose is not neglected, more emphasis is laid on the characteristic genres of poetry and on historiography. Native speakers of Persian are not normally eligible to enrol in this course.
Prerequisite: ISL 322
- ISL 427 **Advanced Turkish** 3S:MWF12
 While the student will continue to read a good deal of modern Turkish, the main emphasis is on Ottoman Turkish: classical, literary and historical material will be studied in detail. Native speakers of Turkish are not normally eligible to enrol in this course.
Prerequisite: ISL 323
- ISL 428 **Readings in Arabic Literature** 2S:N
 A study of Arabic literature, with special emphasis given to the development of a variety of literary genres, based on readings from original texts. The specific period of concentration will be determined in consultation with the students.
Prerequisite: ISL 321, departmental approval
Co-requisite: ISL 425

- ISL 429 **Colloquial Arabic II** (Not offered 1973-74) 2L, 1P
 This course introduces the student to the spoken Palestinian Arabic of Jerusalem. The grammar and structure are explained, and comparisons with other forms of Syrian Arabic are discussed. Emphasis is placed on oral drills. Native speakers of Arabic are not eligible to enrol in this course.
Prerequisite: ISL 325
- ISL 432F **Seminar on Aspects of the Mediaeval Islamic World** 2S:TR11
Prerequisite: Any full course in Islamic history or equivalent.
- ISL 433S **Seminar on the Impact of the West on a Muslim Society** 2S:TR11
Prerequisite: Any full course in Islamic history or equivalent.

ITA**ITALIAN**

Given by the staff of the Department of Italian Studies
Chairman of Department To be announced
Undergraduate Secretary: Professor O. Pugliese
Enquiries: 21 Sussex Avenue, Room 323 (928-5517)

To study "Italian" is not only to acquire a language, but also to study a rich literature and many-sided culture which have played an important, and sometimes dominant, role in western civilization. For Canadians, the Italian contribution bears a special significance: the vast influx of Italians in recent years has brought changes in our way of life and a living presence to reinforce traditional Italian influences, thus enriching the meaning of the term "Canadian".

At the University of Toronto, Italian courses are offered for beginners, for dialect speakers, and for students with Grade XIII standing or equivalent (i.e. "matriculants") in the subject. Stress is laid on both the spoken and written language and opportunities are provided for practice in each year. In the First Year, beginners receive an intensive course including work in the language laboratory (ITA100); dialect speakers without Grade XIII standing or equivalent are offered a full course (ITA110) designed to meet their special needs; students with Grade XIII standing or equivalent take one of the two language offerings ITA152 or ITA153Y according to their level of proficiency, either one of which is a co-requisite for the full courses ITA121 and ITA122, dealing respectively with the twentieth-century novel and theatre. Students well qualified in the Italian language may be excused language courses in the First and Second Years. ITA121 and 122 are also open to students of ITA110. The full course ITA101, open to students of ITA100 only, provides extra language practice, especially oral. In the Second Year, students take either the language full course ITA250, which includes oral practice and is intended primarily for "ex-beginners", or one of the language courses ITA251, 252Y or 253Y according to their level of proficiency: ITA253Y involves private study under supervision. They may also take any or all of the following: ITA222, ITA224F, ITA225S, all of which deal with nineteenth and twentieth-century literature, or ITA240, which deals with the Italian cinema. ITA226, covering some aspects of the twentieth-century novel and theatre is designed for those who have taken ITA100. Almost all 300- and 400-series courses and half-courses are open to students who have taken ITA220 or ITA221 or ITA290Y, though ITA321 is a co-requisite for other literature offerings in these two series. ITA350, a full course on language, has ITA220 as its prerequisite. Third Year students may take 400-series courses if they wish. 300- and 400-series courses offer a wide range of options in literature and language. It is not necessary to take language courses in the Third and Fourth Years, but language courses may be taken without literature courses. In all years, outstanding literary works are read not only for their individual artistic value, but also to illustrate the outlook and intellectual climate of their age. Group discussions and the preparation of reports and essays are important means to this end.

Oral practice is included in all language courses; students not taking these courses are offered oral work (non-credit) at varying levels. Oral proficiency will be certified by the Department.

Opportunities for teaching at the Secondary School level exist for those qualified in Italian and another language. At the university level there may be openings for instructors in Italian.

Italian may be combined with other modern languages and literatures, including English; the appreciation of mutual influences will broaden the student's understanding of each. The three great Italian writers of the fourteenth century, Dante, Petrarch and Boccaccio, and the Italian Renaissance of the two following centuries, profoundly influenced other European literatures. Italian also combines naturally with Latin, and is useful in Fine Art and Music.

Requirements for programmes leading to the Type A course at the Faculty of Education will be found in this Calendar under "Suggested Programmes of Study".

For counselling, students may consult Professor Olga Pugliese (928-5517).

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

NOTE: Students with an adequate knowledge of Italian may substitute for the language courses and half-courses in the First and Second Years another course or half-course, subject to the approval of the Department.

ITA 100 **Italian Language for Beginners** 4L,1P L1:VL1, P1:MTWRF9; NL2, P2:MTWRF10; MTVL3, P3:MTWRF11; UL4, P4:MTWRF12; ML5, P5:MTWRF2; L6:M6.30-9.30p.m.
In this course the student is introduced to the main elements of Italian grammar. The study of modern Italian authors is begun in the second term, with emphasis on language and literary analysis. Oral practice in the classroom and laboratory training are stressed throughout the year. (May not be taken by students with XIII ITA or whose knowledge of Italian is equivalent to or better than that required for XIII ITA.)
Exclusion: ITA 105/110/152/121/122/153Y

ITA 101 **Intensive Oral Practice in Italian** (Formerly ITA 141) 3S S1:MWF9, S2:MWF12
The aim is to enable students to understand spoken Italian and to acquire fluency in speaking. Topics will include material on a variety of aspects of Italian life. After the first few weeks, some time will be devoted to the writing of brief compositions in Italian.
Exclusion: ITA 105/110/152/153Y
Co-requisite: ITA 100

ITA 110 **Italian Language for Dialect Speakers** 2L, 2T ML1, T1:MTWR9, OL2, T2:MTWR12, L3:M7-10p.m.
A course designed for students of Italian descent, born or raised in Canada, who speak an Italian dialect at home, but who have not formally studied standard Italian. The course, conducted entirely in Italian, aims to develop both oral fluency and the ability to write correctly. During the second term, contemporary Italian texts of literary or social significance will be studied. Can be taken only at the discretion of the Department.
Exclusion: ITA 100/101/152/153Y

ITA 121 **Modern Italian Novel** 1L, 1T L1,T1:TR11; L2, T2:TR2
Outstanding novels of this century will be analysed from an artistic viewpoint and discussed within the context of social and intellectual problems of present-day Italy.
Exclusion: ITA 100/101/105
Prerequisite: XIII ITA
Co-requisite: ITA 110/152/153Y

ITA 122 **Modern Italian Theatre** 2L L1:MW1, L2:R7.30-9.30 p.m.
The *Teatro grottesco* and its contribution to the ideas of relativity and absurdity. The problem of the subconscious in the psychological drama of Bracco. New techniques in the theatre and their use by Pirandello. Themes of justice and guilt in post-World War II drama.
Exclusion: ITA 100/101/105
Prerequisite: XIII ITA
Co-requisite: ITA 152/153Y

ITA 152 **Language Practice** (Formerly ITA 120Y) 3S MOS1:MWF9, S2:MWF10,
S3:MWF1, S4:M7-9.30p.m.
This course, conducted entirely in Italian, is for students with Grade XIII Italian or equivalent. It consists of a review of grammar, the writing of short compositions and oral practice.
Exclusion: ITA 100/101/105/110/120Y/153Y
Prerequisite: XIII ITA

ITA 153Y **Essays in Italian** (Formerly ITA 190Y) 1L:F4
This course offers those who already have written and oral proficiency in Italian an opportunity for more advanced study of the language. Topics will be chosen from contemporary events of special interest to the students in order to increase fluency in expression.
Exclusion: ITA 100/101/105/110/152
Prerequisite: XIII ITA

ITA 195Z **Reading Course in Italian** 1L:M1
A non-credit course for graduate and undergraduate students in any faculty.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

ITA 222 **Nineteenth and Twentieth Century Novel** 1L, 1T L1, T1:TR9, L2, T2:TR1,
L3, T3:M7.30-9.30p.m.
Manzoni's development of the historical novel as a vehicle for his vision of life. *Verismo* and Verga's new technique to express the social and political problems facing united Italy. The novel after the Second World War. Political consciousness in a fragmented world. The anti-hero and the importance of myth.
Exclusion: ITA 226
Prerequisite: ITA 100/110/120Y/190Y
Co-requisite: ITA 250/251/252Y/253Y

ITA 224F **Nineteenth Century Italian Poetry** 1L, 1T:TR10
A study of the major Italian poets of the nineteenth century, with special reference to Leopardi, Pascoli and D'Annunzio.
Prerequisite: ITA 100/110/120Y/190Y
Co-requisite: ITA 250/251/252Y/253Y

ITA 225S **Twentieth Century Italian Poetry** 1L, 1T:TR10
A study of the major Italian poets of the twentieth century with special reference to Ungaretti, Montale and Quasimodo.
Prerequisite: ITA 100/110/120Y/190Y
Co-requisite: ITA 250/251/252Y/253Y

ITA 226 **Twentieth Century Literature** 2L:TR11
This course is designed to introduce students who have taken ITA100 to a critical and literary appreciation of some representative Italian novels and plays of this century. This course will count for specialist qualification.
Exclusion: ITA 222
Prerequisite: ITA 100
Co-requisite: ITA 250

ITA 240 **Italian Cinema** 2L:TR3
An analysis of the Italian film as an artistic genre, and its relation to literature from Neo-Realism (1942) to the present.

- ITA 250 **Intermediate Italian I** (Formerly ITA 220) 3S MS1:MWF11, S2:MWF12, S3:MWF2,
S4:T7.30-9.30p.m.
Discussions and drills in Italian grammar. Exercises in writing brief essays in Italian. The course is conducted primarily in Italian and will include opportunities for oral practice.
Exclusion: ITA 251/252Y/253Y
Prerequisite: ITA 100
- ITA 251 **Intermediate Italian II** 3S:MWF1
Review of the basic material of the first year with a more detailed presentation of grammar. Emphasis will be laid on oral practice and short essays throughout the year.
Exclusion: ITA 250/252Y/253Y
Prerequisite: ITA 110
- ITA 252Y **Prose Expression in Italian** (Formerly ITA 221) 2S S1:MW1, S2:TR10,
S3:TR3, S4:T7.30-9.30p.m.
Discussion of problems connected with vocabulary and syntax. Analysis of examples of modern expository prose. Exercises in essay writing. The course is conducted in Italian.
Exclusion: ITA 250/251/253Y
Prerequisite: ITA 152/153Y (formerly ITA 120Y/190Y)
- ITA 253Y **Essay on Modern Italian Topics** (Formerly ITA 290Y) N
This course is designed for students whose command of Italian exempts them from ITA 252Y. It aims to develop their appreciation of Italian prose style and to refine their own powers of expression.
Exclusion: ITA 250/251/252Y
Prerequisite: ITA 120Y/190Y

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

NOTE: Courses in the 300- and 400-series may be taken in Third or Fourth Years, but the choice of option is subject to the approval of the Department.

- ITA 321 **Dante** 2L, 1T L1, T1:MWF9, L2, T2:MWF3, L3:R7.30-9.30p.m.
A study of the *Divina Commedia* (*Inferno* and *Purgatorio*) within the literary and social context of the Middle Ages.
Prerequisite: ITA 220/221/290Y
- ITA 322F **Italian Linguistics** 2L, 1T:MWF10
A course designed for students having a knowledge of Italian and/or Italian dialects but no background in linguistics. Concepts of general linguistics. Italy as a linguistic entity. The structure of contemporary Italian, with special regard to its sound system and grammatical categories. The course is conducted in Italian.
Prerequisite: ITA 220/221/290Y
- ITA 323S **Trends in Renaissance Thought** 2L, 1T:MWF10
The emphasis will fall on the Renaissance view of man and of his place in the political and social spheres and also on concepts of history in their relationship with this view. Among prose authors read will be Machiavelli, Guicciardini and Castiglione.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 325 **Eighteenth Century Prose and Drama** 2L:TR11
Currents in eighteenth century thought as reflected in selected prose works of Muratori, Gravina, Vico, Baretti, Beccaria and Cesarotti. Tradition and innovation in dramatic forms. Selected plays of Metastasio, Goldoni and Alfieri.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321

- ITA 326F **Petarca** 2L, 1T L1, T1:MWF12, L2:T7.30-9.30p.m.
 A study of the *Canzoniere* as a fundamental work considered in relation to the Middle Ages and the Renaissance.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 350 **Language Practice (Formerly ITA 320)** 3S S1:MWF9, S2:MWF1, S3:MWF3, S4:W7-9.30p.m.
 Prose passages will be analysed for a better understanding of the structure of the language and will serve also as a source of topics for compositions in Italian. Problems of grammar and syntax will be discussed according as they occur in individual compositions.
Prerequisite: ITA 220
- ITA 420 **Renaissance Epic Poetry** 3L:MWF11
 The development from Arthurian and Carolingian legends to romances of chivalry. Ariosto's *Orlando Furioso* as a Renaissance work of art; Tasso's *Gerusalemme Liberata* as typical of the Counter-Reformation.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 421F **Renaissance Comedy** 2L, 1T:MWF1
 An examination of the theory and practice of comic composition for the theatre in sixteenth century Italy.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 422F **Concepts of the Baroque** 2L, 1T:MWF2
 Seventeenth century philosophical, scientific, historical, and literary prose. Selections from the works of Bruno, Campanella, Galileo, Boccacini, Sarpi, Bartoli, Redi, and Magalotti.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 424S **Dante's Paradiso** 2L, 1T:MWF1
 The nodal images and key allegories of "Paradiso terrestre." The fusion of Christian symbolism and Roman mythology in the third *cantica* of the *Commedia*. Autobiography, history, and criticism of contemporary institutions and public figures in *Paradiso*. Realism and fiction in Dante's cosmology of the heavens.
Prerequisite: ITA 220/221/290Y and ITA 321
- ITA 425F **Thirteenth Century Poetry** (Not offered 1973-74) 2L, 1T
 The *contrast* and debates in the literary languages of the North and the South. The theory of *fino amore* and *folle amore*. The changing aspects of the love lyric in the schools of Palermo, Bologna and Florence, Umbria and the Centre. The allegorical poetry of Brunetto Latini, the *Fiore* and the *Intelligenza*.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 426 **Twentieth Century Novel and Theatre** 2L:TR10
 A study of major Italian novelists and dramatists from the turn of the century to the present. Existential dilemmas and the search for an authentic existence.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321

- ITA 427S **Boccaccio** (Formerly ITA 433S) 2L,1T L1:MWF12, L2:T7.30-9.30p.m.
A study of the *Decamerone* as a work reflecting the life and times of the late Middle Ages, with particular emphasis on the art of Boccaccio as a writer of the short story.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 428F **Neo-Classic and Pre-Romantic Poetry** 2L, 1T:MWF3
The uses of myth and the “new man” in the poetry of Parini, Alfieri, Monti and Foscolo.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 429F **Italian Stylistics** 2L, 1T:MWF9
A course designed to help students in developing an acceptable prose style. Discussion of matters pertaining to syntactic structure, lexical choice, levels of style. Reading of selected prose passages and written exercises. The course is conducted in Italian.
Prerequisite: ITA 220/221/290Y
- ITA 430S **History of the Italian Language** 2L, 1T:MWF9
The linguistic transition from Latin to Italian. Historical phonology and morphology, and problems relating to syntax and lexicon. Reading and linguistic analysis of early Italian texts. The course is conducted in Italian.
Prerequisite: ITA 220/221/290Y
- ITA 431S **Modern Italian Literary Criticism** 2L:TR12
Criticism from Romanticism to the present day. De Sanctis, the historical school of the late nineteenth century, the idealistic aesthetics of Croce. Post-Crocean historical, Marxist and stylistic criticism. Emphasis is placed on class discussion and the development of the students’ own viewpoints.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 434S **Baroque Poetry and Drama** (Formerly ITA 324S) 2L, 1T:MWF2
Marinism and anti-marinism in poetry. The mock-heroic poem. Drama. Selected works of Marino, Testi, Chiabrera, Tassoni, Guarini, and Della Valle.
Prerequisite: ITA 220/221/290Y
Co-requisite: ITA 321
- ITA 450Y **Advanced Composition** (Formerly ITA 432Y) 1S:R1
A course designed for students who have completed ITA 320 and whose native language is not Italian or for Third Year Matriculants who have completed ITA 221. Modern Italian prose passages will be analysed and discussed and serve also as the main source of topics for composition. The course will be conducted in Italian.
Exclusion: ITA 429F
Prerequisite: ITA 221/320

JAPANESE - See EAS “East Asian Studies”

JOINT COURSES

Given by the staff of two or more departments

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- JAH 324 **Peasants and Feudal Institutions** 1L, 1T:W9-11
A comparative study of mediaeval European and other historical and contemporary peasant societies with reference to the development of various social, economic and political institutions, including military feudalism. *R.V. Colman, W. Weissleder.*

- JAL 100 **Introduction to General Linguistics** 2L, 1T L1:TR9, L2:TR10, L3:M7.30-9.30p.m., T:N
Lectures on fundamental principles with illustrations from English and from a broad spectrum of other languages. Tutorials for practice in production and recognition of speech sounds, and elementary analytic techniques. (Given by the Departments of Anthropology and Linguistics.)
- JES 126 **Visual and Performing Arts of East and South Asia** 2S:TR11
An introductory survey of the archaeology, visual arts, music and theatre of the areas of Indian, Chinese and Japanese culture. The intention of the course is to stimulate interest in and further the study of these aspects of Far Eastern civilization. (Given by the Departments of East Asian Studies and of Sanskrit and Indian Studies.) *D.B. Waterhouse* (EAS), *R.M. Smith* (SIS), *B.A. Stephen* (EAS) and staff.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- JER 370 **The Bible and English Literature**
(See INV 300 under "Victoria College Courses")
- JES 333 **Chinese Buddhist Philosophy** 2S:TR10
An introduction to the T'ien-t'ai and Hua-yen doctrine of the universal immanence of supreme enlightenment. (Given by the Departments of East Asian Studies and of Sanskrit and Indian Studies.) *C.D.C. Priestley*.
- JLM 280 **Introduction to Mathematical Linguistics** 2L:TR10
An introduction to formal grammars and their relevance to the study of natural languages, comprising a basic literacy course in symbolic logic, elementary set theory, automata theory, and other areas of mathematics relevant to Linguistics. (Given by the Departments of Mathematics and Linguistics.) (Offered in alternate years.)
Prerequisite: JAL 100/Grade XII Maths., or consent of instructor.

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- JAL 300 **Sociolinguistics** 2L:TR11
The use of language from social perspectives: Dialects and standard languages; speech styles; argots, substandard and other varieties; language planning and schooling; the politics of language. (Offered in alternate years.) (Given by the Departments of Anthropology and Linguistics.)
Prerequisite: JAL 100
- JAL 301 **Language and Social Issues** (Not offered 1973-74) 2L
A sociolinguistic examination of problems in Canadian education, politics, mass communications, etc. Offered in alternate years. (Given by the Departments of Anthropology and Linguistics.)
Prerequisite: JAL 100
- JAL 303F **Sociolinguistic Methods** (Not offered 1973-74)
- JAZ 421F **Human Genetics** (Not offered 1973-74) 1L, 3P
A course on the major features of the genetics of man, including his Mendelian inheritance, biochemical genetics, cytogenetics, and population genetics. The laboratory illustrates major principles by practical work and demonstrations. (Given by the Departments of Anthropology and Zoology.)
Prerequisite: ZOO 211/226/ANT 336

- JBM 350 General Virology** 2L:TR2, 3P:T9-12
 A course designed to provide an introduction to the study of viruses. Lectures will cover both fundamental and applied aspects of the viruses of vertebrates, invertebrates, plants and bacteria. The laboratories will provide instruction in basic techniques used in the study of viruses. Limit of enrolment: 56. (Given by Departments of Botany and Microbiology.) *J.B. Campbell* and *G.B. Orlob*.
Prerequisite: MBL 200, BOT 240 recommended
Co-requisite: BCH 320/321 recommended
- JHP 343 Introduction to South African History and Politics** 2L:TR1
 This course will concentrate upon an historical and political analysis of the causes, the operation and the consequences of the pattern of racial domination established in southern Africa. Open to second-year students with permission of instructor. *M. Klein, R.C. Pratt*.
- JMC 300 Modern China in Revolution** 2S:MW12
 An inter-disciplinary course that traces the history, social context, and political theory of revolutionary trends in China from the Reform Movement of the 1890's to the Great Cultural Proletarian Revolution of the late 1960's. (Given by the Departments of East Asian Studies, History, and Political Economy.) *J.L. Cranmer-Byng* (HIS) and *V. Falkenheim* (POL).
- JMC 400 Nationalism and Social Change in Contemporary China** (Not offered 1973-74) 2S
 An inter-disciplinary seminar that examines various aspects of social change in China since 1900. The second term will deal exclusively with the period since 1949. Themes to be developed include nationalism, culturalism, modernization, urban and rural development, authoritarianism, and utopianism. (Given by the Departments of East Asian Studies and Political Economy.)
Prerequisite: JMC 300
- JPA 300 Physics and Archaeology** 2L:TR12, 1P:N
 A course for students of archaeology describing the application of physics techniques to problems of archaeological interest. Topics include: radiocarbon dating, potassium argon dating, resistivity surveying, metal detectors, magnetic location, magnetic dating, thermoluminescence dating, optical emission spectroscopy, neutron activation analysis, x-ray fluorescence analysis, β -ray backscattering analysis; cosmic ray absorption.
Reference: Aitken, *Physics and Archaeology*
- JPZ 252 Parasites and Parasitism** 2L:TR4, 3P:W9-12
 Parasites and their interrelationships with other organisms will be discussed. Biological principles will be developed from considerations of the morphology and life cycles of selected organisms, their evolutionary history and their adaptations to a parasitic mode of life. (Given by the Departments of Parasitology and Zoology.) *S.S. Desser*.
Prerequisite: BIO 100/110/120
- JPZ 443F Physiology of Symbiotic and Parasitic Organisms** 2L, 2P:N
 The course is aimed at zoology students interested in the general physiological implications of a close association between two organisms, as well as those particularly interested in parasitic organisms. Topics discussed include the adaptations for reaching and recognizing hosts, and for establishing a symbiotic or parasitic association; symbiote nutrition, metabolism and biochemical adaptation; the physico-chemical effects of a symbiote upon the host organism. (Given by the Departments of Parasitology and Zoology.) *D.F. Mettrick* (ZOO), *K.A. Wright* (PST).
Prerequisite: JPZ 252/ZOO 221; some biochemistry is also recommended.

COURSES OPEN ONLY TO FOURTH-YEAR STUDENTS

- JEP 400 **Politics and Economic Development** 2S:M4-6
 The political economy of development in the Third World. Various perspectives in economics and political science will be used to analyse such questions as: the causes of continuing underdevelopment in the Third World; alternative paths of development; selected public policies relating to developmental objectives. *G.H. Helleiner, C.R. Pratt.*
Prerequisite: ECO 200/202 or at least one course in the politics of a developing area.

LAT

LATIN

Given by the Intercollegiate Department of Classics
See also GLL, GRH, GRK

Students should refer to the essay published under "Classics"

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- LAT 100 **Introductory Latin** 4S S1:UVS1:MWF9, F1; MS2:MTWR12
 This course is designed to acquaint the student with the essentials of the Latin language and to introduce him to Roman literature. It may not be taken by students with Grade XII Latin or equivalent except by permission of the Department.
- LAT 120F **The Poetry of Catullus** 3S MUS1:MWF12, TVS2:MWF2
 Selections from the work of Catullus, including both the love poetry and the poetry of social comment, with particular emphasis on the literary value of Catullus' work. The course includes study of the Latin language.
Prerequisite: XIII LAT/LAT 100/130
Co-requisite: Any other half or full course in the same subject.
- LAT 121S **The Poetry of Horace** 3S MUS1:MWF12, TVS2:MWF2
 Selections from the *Odes* of Horace, with particular emphasis on the literary quality of Horace's lyric poetry. The course includes study of the Latin language.
Prerequisite: XIII LAT/LAT 100/130
Co-requisite: Any other half or full course in the same subject.
- LAT 122F **The Life and Times of Julius Caesar** 3S US1:MW3, MS2:MWF9
 A study, as a historical source, of Suetonius' biography, *The Divine Julius*, for the light it throws on the character and career of Julius Caesar, the key figure in the collapse of the Roman Republic. The course includes study of the Latin language.
Prerequisite: XIII LAT/LAT 100/120
Co-requisite: Any other half or full course in the same subject
- LAT 123S **Cicero and Roman Oratory** 3S MVS1:MWF9, TS2:MWF3
 Reading of Cicero, *Pro Caelio*. This speech, which deals with a famous trial in the circle of Catullus, is studied for the light it sheds on social life at the end of the Roman Republic and as an illustration of Cicero's skill as an orator. The course includes study of the Latin language.
Prerequisite: XIII LAT/LAT 100/130
Co-requisite: Any other half or full course in the same subject
- LAT 130 **Intermediate Latin** 3S:TRF1
 This course is designed for the student who has not taken Latin beyond Grade XII. Cicero's *Fifth Verrine Oration* and Ovid, *Metamorphoses I* are read and the course includes study of the Latin language. Note: This course may not be taken by students with Grade XIII Latin or equivalent except by permission of the Department.

COURSES OPEN TO SECOND- OR HIGHER-YEAR STUDENTS

- LAT 219F **Roman Comedy** 3S VS1:MWF11, TS1:MWF12
 A study of Roman Comedy, based on the reading of a play of Plautus and a play of Terence. (Prose Composition is required of specialists if not taken in connection with another LAT course.)
Prerequisite: LAT 100/130 or two of LAT 120F/121S/122F/123S
Co-requisite: Another full or half course in LAT
- LAT 220S **Lucretius** 3S VS1:MWF11
 A study of selected texts from Lucretius' philosophical poem, *De Rerum Natura*. (Prose Composition is required of specialists if not taken in connection with another LAT course.)
Prerequisite: LAT 100/130 or two of LAT 120F/121S/122F/123S
Co-requisite: Another full or half course in LAT
- LAT 221S **Livy** 3S MS1:MWF2
 An introduction to Livy's great history of Rome, from the beginnings to his own day, in which he set himself to give Rome a history that in conception and style should be worthy of her imperial rise and greatness. (Prose Composition is required of specialists if not taken in connection with another LAT course.)
Prerequisite: LAT 100/130 or two of LAT 120F/121S/122F/123S
Co-requisite: Another full or half course in LAT
- LAT 222 **Christian and Mediaeval Latin** 3S TS1:MWF10, MS2:MWF1
 Latin in a new milieu. Selections of prose and poetry.
Prerequisite: LAT 100/130 or two of LAT 120F/121S/122F/123S
- LAT 223 **Cicero and His Times** 3S VS1:MWF10, TS2:MWF3
 A wide selection of Cicero's letters is read to reveal the many interests of this statesman, philosopher and writer. The course includes a general study of Roman public and private life in the late Republic, as illustrated by its most eloquent and prolific commentator. (Prose composition is required of specialists if not taken in connection with another LAT course.)
Prerequisite: LAT 100/130 or two of LAT 120F/121S/122F/123S

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- LAT 320 **Virgil** 3S:MWF2
 A study of the poet's literary achievement, with reading of the *Aeneid* and selections from the *Eclogues* and *Georgics*.
Prerequisite: Any full course, or two half-courses in the LAT 200-series.
- LAT 321 **Criticism of Latin Poetry** 3S:MWF11
 Based on the study of Catullus (including poems 64 and 68), Horace (selected *Odes* and *Epistles* and *Ars Poetica*) and selections from the elegiac poetry of Propertius, Tibullus and Ovid. Overlap with LAT 120F and 121S is minimal.
Prerequisite: Any full course, or two half-courses in the LAT 200-series
- LAT 322 **Roman Philosophy** 2S:R4-6
 Based on readings from Cicero, *De Finibus*, *De Fato*, and Lucretius, *De Rerum Natura*. (Offered in alternate years.)
Prerequisite: Any full course, or two half-courses, in the LAT 200-series

- LAT 323 **Roman Historiography** (Not offered 1973-74) 3S
 A survey of the principal Roman historians, studied for their literary achievement and for their contributions to historiography and its development. Based on readings from Caesar, Sallust, Livy and Tacitus. (Offered in alternate years.)
Prerequisite: Any full course, or two half-courses, in the LAT 200-series
- LAT 420 **Roman History 31 B.C.-A.D. 68** 2S:M4-6
 A study of the foundation of the Principate and of the achievements of the Julio-Claudian emperors, based on the reading of *Res Gestae* and Tacitus, *Annals* I-VI or XI-XVI.
Exclusion: GRH 313 in the same year
Prerequisite: Any LAT 300-series course, or a full course or two half-courses in the 200-series
- LAT 421 **Roman Satire** 3S:MWF3
 A study of the development of Roman satirical writing, based on selections from Horace, Persius, Juvenal, Petronius, Seneca, Martial and Lucilius.
Prerequisite: Any LAT 300-series course, or a full course or two half-courses in the 200-series
- LAT 430Y **Latin Prose Composition** 1S:N
Prerequisite: Any LAT 300-series course, or a full course or two half-courses in the 200-series
- LAT 431Y **Comparative Philology of Greek and Latin** 1S:N
Prerequisite: Courses in LAT and/or GRK according to Specialist Programmes
- LAT 440F **Ovid** 3S:TR2
 A study of the poet's literary achievement. The texts read will include selections from the *Metamorphoses* and *Ars Amatoria*.
Prerequisite: Any LAT 300-series course, or a full-course or two half-courses in the 200-series
- LAT 441S **Apuleius** 3S:TR2
 With readings from the *Metamorphoses* (or *Golden Ass*). The study of a Latin novel, its author, setting, literary background, and baroque style.
Prerequisite: Any LAT 300-series course, or a full course or two half-courses in the 200-series
- LAT 442F **Roman Rhetoric** (Not offered 1973-74) 3S
 A study of the theory and practice of oratory, based on readings from Cicero, *De Oratore*, Quintilian XII, and Tacitus, *Dialogus*. (Offered in alternate years.)
Prerequisite: Any LAT 300-series course, or a full course or two half-courses in the 200-series
- LAT 443F **Seneca and Pliny** 3S
 A study of literature and society in Rome in the reigns of Nero and Trajan, based on the reading of select letters of Seneca and Pliny. (Offered in alternate years.)
Prerequisite: Any LAT 300-series course, or a full course or two half-courses in the 200-series
- LAT 444S **Lucan** (Not offered 1973-74) 3S
 A study of Lucan's literary achievement based on the reading of selections from his *De Bello Civili*. This unique historical epic gives a poetic account of the civil war between the forces of Julius Caesar and Pompey the Great which, in Lucan's view, brought the Roman Republic to an end. (Offered in alternate years.)
Prerequisite: Any LAT 300-series course, or a full course or two half-courses in the 200-series

- LAT 445S Senecan Tragedy** 2S:TR11
 The only surviving Latin tragedies are placed against the background of Greek Tragedy and Augustan poetry and are considered for their importance in the development of modern European drama. (Offered in alternate years.)
Prerequisite: Any LAT 300-series course, or an approved full course or two half-courses in the 200-series

LIN LINGUISTICS

Director, Centre for Linguistic Studies: Professor N.E. Collinge
Undergraduate Co-ordinator: Professor J.K. Chambers (928-6489)
Enquiries: 43 Queen's Park Crescent East (928-3479)

The aim of Linguistics is to develop an understanding of how all languages work, and of how languages use disparate means for the same effects. The theme is the unity and the variety of human language. Such a theme subsumes many variations, including grammatical theory and its application to data, language divergence and convergence in space and time, and the sociocultural stratification of linguistic systems.

Undergraduate Linguistics is justified principally as a normal component of a liberal education. It is naturally available as pre-professional training for teaching and research in disciplines such as psychology, philosophy, literature and language studies, where the contribution of Linguistics is increasingly recognized as important. But the principal aim is to make a contribution to a liberal education within the undergraduate years, an enrichment of the preparation for civic life and for a broad spectrum of professions.

There is no fixed programme for specializing in Linguistics alone. Instead, appropriate programmes are created (with advice when asked for) by the students, who are encouraged to combine Linguistics and some convergent area(s), such as Anthropology, Computer Science, English, Mathematics, Modern Languages, Philosophy, Psychology, Sociology, etc. Five or six Linguistics courses are the normal component for a combined programme.

The admission requirements for the one-year M.A. programme in Linguistics are: JAL 100, LIN 228F and 229S, LIN 230, and three other LIN or JAL courses in a four-year undergraduate degree.

In preparing their programmes, students should note that courses LIN 220, JLM 280, JAL 300, JAL 301, LIN 333, and 348 are offered in alternate years only. Consequently, students with a special interest in, say, LIN 348 should enrol in that course at the earliest opportunity after completing the prerequisites for it.

- JAL 100 Introduction to General Linguistics**
 (See JAL under "Joint Courses")
- LIN 201S Language Learning** 3L:MWF11
 Theory of language behaviour, with emphasis on studies of language acquisition in childhood.
Prerequisite: PSY 224F
- LIN 220 Bases of Linguistic Theory** 2L:TR2
 Exploration of some current tasks in linguistics and the theoretical basis of practical work. The linguist's approaches are contrasted with those of philosophers, language teachers and others. (Offered in alternate years.)
Prerequisite: JAL 100 or departmental consent
- LIN 228F Phonetics** 2L:W4-6, 1P:N
 Investigation of the sounds most commonly used in languages from an articulatory and acoustic point of view, with practice in their recognition and production.

- LIN 229S **Sound Patterns in Language** 2L:W4-6, 1P:N
The nature and organization of phonological systems, with survey of their variety and practical work in analysis.
Prerequisites: JAL 100 and LIN 228F, or departmental consent
- LIN 230 **Grammatical Patterns in Language** 2L:TR1
The nature and organization of morphological and syntactic systems, the relation of these to semantic systems and the linguistic organization of discourse, together with practical work in grammatical analysis.
Prerequisite: JAL 100 or departmental consent
- JLM 280 **Introduction to Mathematical Linguistics**
(See JLM under "Joint Courses")
- JAL 300 **Sociolinguistics**
(See JAL under "Joint Courses")
- JAL 301 **Language and Social Issues**
(See JAL under "Joint Courses")
- LIN 333 **Structure of English** 2L:EVE
A systematic approach to the structure of present-day English, with attention to semantic, syntactic and phonological patterns. (Offered in alternate years.)
Prerequisite: JAL 100 or departmental consent.
- LIN 342F **Introduction to Transformational Grammar** 3L:MWF1
An introduction to the foundations and the formal framework of transformational-generative theory, with concentration on the 'standard model' of Chomsky as the prototype for subsequent developments in the field.
Prerequisite: JAL 100 or departmental consent
- LIN 343S **Introduction to Stratificational Grammar** 3L:MWF1
An investigation of language as a multistratal system and the efforts to formulate this view into theories, including a comparison of stratificationalism with various other theories.
Prerequisite: LIN 342F/PSY 224F/departmental consent
- LIN 348 **Language History** (Not offered 1973-74) 2L
The processes of linguistic change through time. Survey of the internal history of the Indo-European language family and discussion of selected topics drawn from this and other families. (Offered in alternate years.)
Prerequisite: JAL 100 or departmental consent
- LIN 491/492 **Advanced Topics** N
Enrolment in a graduate course.
Prerequisite: Departmental consent
- LIN 493F/494S **Advanced Topics** N
Enrolment in a graduate half-course.
Prerequisite: Departmental consent

NOTE: Students of Linguistics should also refer to ANT 220, 222, 420, INX 210, 310, MAT 409S, PSY 224F.

LITERATURE - See INL "Interdisciplinary Literature Courses"

MARATHI - See SIS "Sanskrit and Indian Studies"

MAT**MATHEMATICS**

Includes Actuarial Science (ACT), Applied Mathematics (APM), Mathematics (MAT), and Statistics (STA).

<i>Chairman of Department:</i>	Professor G.F.D. Duff
<i>Undergraduate Secretary:</i>	Professor N.A. Derzko
<i>Student Counselling:</i>	928-5082
<i>Departmental Office:</i>	Sidney Smith Hall, Room 4072 (928-5164)

Mathematics historically was concerned with concrete notions of space and number. From these concrete notions have evolved such abstract ideas as “set” and “group” which form the subject matter of contemporary Mathematics, and Mathematics today may be considered as the art or science of making deductions from given statements. The deductions themselves and the methods used to make them come within the scope of Mathematics, while the original statements (hypotheses) largely lie outside. The observation that the results deduced apply to any collection of objects and relations that satisfy the hypotheses is the key to the immense power and surprisingly wide utility of Mathematics.

There are many different motivations for the study of Mathematics. To the humanist, Mathematics is part of the mainstream of human culture. To the scientist, engineer, or social scientist it is an important working tool. To the mathematician, it is an end in itself. The Department of Mathematics attempts to provide courses to suit all these diverse viewpoints

The pure mathematician is interested in abstract mathematical structures in their own right. He is guided by considerations of taste, beauty, and rigour and may view his subject as an art. The main fields of pure Mathematics are algebra, analysis, geometry, topology, and foundations.

The applied mathematician is more interested in how he can use those structures to study some aspect of the world around him. Applied Mathematics, originally used to describe the application of Mathematics to certain classical fields of Physics, today includes also such fields as optimization theory, communication theory, combinatorics, theory of games, and numerical analysis. (Such areas as programming languages, and automata form part of the rapidly growing subject of Computer Science.) Originally used to describe the collection and tabulation of records required for conducting the affairs of a State, Statistics today is a discipline concerned with the production and assessment of quantitative evidence. Actuarial Science includes such topics as the theory of compound interest, and the application of probability theory to the hazards of survival. Although historically the main applications of Mathematics have been to physical sciences, contemporary Mathematics has significant utility for nearly all sciences, and for such diverse subjects as Economics and Linguistics. Mathematics is the language of precise thought.

The professional mathematician is most likely to find employment in universities, in the civil service or in government laboratories, and in financially or technologically oriented business firms. Research positions require post-graduate study. Such fields as teaching, computing, applied statistics, and actuarial science offer opportunities for B.Sc. graduates. A training in Mathematics has traditionally been a strong preparation for careers in law and business; today it is also an excellent foundation for further work in a wide variety of fields in the sciences and social sciences, especially when the interplay of many complex factors is involved.

Students who are contemplating graduate work in Mathematics, Applied Mathematics, or Statistics are advised to follow the Programme in Mathematics. The Programme in Mathematical Studies is designed mainly for those who, after graduation, wish to use their mathematical training in other fields; it provides rather more flexibility and a correspondingly reduced emphasis on mathematical analysis. The Programme in Mathematics for Teaching is less concentrated, but also satisfies the Type A requirements of The Faculty of Education. The Programme in Actuarial Science is designed to meet the specialized requirements of this field. For students with interdisciplinary interests, programmes in Chemistry and Mathematics, Mathematics and Biology, Mathematics and Economics, Mathematics and Linguistics, Mathematics and Philosophy, and Mathematical Physics are available. Students who contemplate enrolling in these programmes of specialization should consult the requirements given elsewhere. These programmes are of course only suggestions for specified purposes: they are not the only programmes combining the subjects indicated by their names. Students are encouraged to make up their own combinations of courses to meet their own needs.

The sequential nature of Mathematics means that prerequisites are essential in many courses and steady work is usually required. Students are advised to consult the prerequisites of courses in which they may be interested in subsequent years. A student who wishes to take a course in Mathematics for which he lacks the required prerequisite may be permitted to do so if, in the opinion of the Department, he demonstrates adequate preparation for the course. He must apply to the Undergraduate Secretary of the Department for such waiver of prerequisite and is strongly advised to do so, preferably in person, as early as possible, and at least two months before the beginning of term. At that time suitable study material will be suggested. An examination may be required before the beginning of term.

All courses offered by the Department are open to all students having appropriate prerequisites and co-requisites unless otherwise noted; however, enrolment may be restricted in cases of duplication of credit.

Grade XIII prerequisites are stated both in terms of MAT A and B, and in terms of the three single-credit courses recently introduced. The following notation is used for the latter:

R & F: Functions and Relations

C: Calculus

A: Algebra

The following courses have prerequisites that are normally met by students entering the University from the secondary schools:

No prerequisite: MAT 110, MAT 120

Prerequisite of MAT A/R & F: MAT 130, MAT 225

Prerequisite of MAT A/R & F and C: MAT 134, MAT 135

Prerequisite of MAT A and B/R & F, C and A: MAT 139, MAT 140, MAT 150.

Only one course in each of the following exclusion groups can be taken for credit, because of similarity of content:

(i) MAT 110, 130, 134, 135, 139, 150

(ii) MAT 140, 224F, 225

Other exclusions are given with course descriptions.

Students with R & F, C and A or both MAT A and B (with high marks) in Grade XIII who are contemplating a programme of specialization in Mathematics (including Applied Mathematics and Statistics) are advised to take MAT 140 and 150. Students with the same background who can take only one course in Mathematics should elect MAT 139: if they later wish to follow the Mathematics Programme, they should consult the Undergraduate Secretary. MAT 135 and 134 have the same mathematical content but are designed for students interested primarily in science or social science, and are less intensive than MAT 139 or 150. Students with less than 66% in C or MAT A are advised not to select these courses. MAT 130 is a less demanding calculus course that still provides an adequate foundation for further work. MAT 110 along with a new second year half-course MAT 210F is a special version of MAT 130 designed for students without Grade XIII Mathematics; MAT 110 and 210F will be equivalent to MAT 130 for prerequisite purposes, and MAT 110 may in some circumstances serve in place of MAT 130 as a co-requisite. MAT 120 is a cultural course, particularly for students in the humanities or other non-science fields who seek to learn something about Mathematics as a discipline rather than gain a technical training in the subject.

Students should consult the section "B.Sc. Programmes" and the departmental advisers for further information. Appointments for individual counselling should be arranged with the Undergraduate Secretary of the Department.

SUGGESTED COURSES FOR UPPER-YEAR STUDENTS WITH INDICATED INTERESTS

Interest	ACT	APM	MAT	STA
<i>Non-Specialists</i>		331F 336S	220, 225, 300, 314F, 319S, 325, 364F	222, 232
<i>Social Sciences</i>	223F, 233S	336S, 451F	234, 314F	232, 342S
<i>Biological Sciences</i>			225, 235	232, 332F
<i>Physical Sciences</i>		331F, 346S, 446S	235, 239, 244F	232, 347S

- MAT 110 Introduction to Differential Calculus** 2L,2T L:TR10, T1:F1-3, T2:F3-5
 Functions, mappings, relations. Limits, derivatives, applications.
 (This course is not open to students who have recently completed a Grade XIII mathematics course or equivalent.)
Exclusion: MAT 130/134/135/139/150
- MAT 120 Introduction to Mathematics** 2L, 2T L:TR12, T1:M3-5, T2:M11-1
 The nature and role of mathematics, illustrated primarily by the development of numerical and geometric ideas. Lectures, films, study of mathematical literature, and the writing of an essay. Tutorials will provide opportunity for doing mathematics as well as talking about it.
- MAT 130 Calculus** 2L, 2T L:TR10, T1:F1-3, T2:F3-5
 Basic calculus. Techniques of differentiation and integration. Calculation of limits. Related rates. Extreme values. Graph sketching. Applications of integration.
Exclusion: MAT 110/134/135/139/150
Prerequisite: XIII MAT A/R & F
- MAT 134 Calculus for Social Scientists** 2L:TR10, 2T:F1-3
 Limits, continuity, the derivative, extremal problems in one variable. The Riemann integral, antiderivatives and the fundamental theorem. Systematic techniques of integration. Vector spaces, linear transformations, matrices, determinants, linear equations. (MAT 134 has the same mathematical content as MAT 135, but illustrations will be drawn from the Social Sciences.)
Exclusion: MAT 110/130/135/139/150
Prerequisite: XIII MAT A/R & F and C
- MAT 135 Calculus for Scientists** 2L:TR10, 2T:T1:F1-3, T2:F3-5
 Limits, continuity, the derivative, extremal problems in one variable. The Riemann integral, antiderivatives and the fundamental theorem. Systematic techniques of integration. Vector spaces, linear transformations, matrices, determinants, linear equations. (MAT 135 has the same mathematical content as MAT 134, but illustrations will be drawn from the Physical Sciences.)
Exclusion: MAT 110/130/134/139/150
Prerequisite: XIII MAT A/R & F and C
- MAT 139 Calculus with Linear Algebra** 2L:TR10, 2T:F3-5
 Limits and continuity, uniform continuity. Differentiation; integration; the fundamental theorem; evaluation of definite integrals. Mean value theorem, extremum problems. Taylor's theorem; uniform convergence; vector spaces; linear independence; basis. Linear transformations; rank and nullity; determinants; eigenvalues. Matrices; systems of linear equations. Introduction to differential equations. Partial derivatives and applications.
Exclusion: MAT 110/130/134/135/150
Prerequisites: XIII MAT A and B/R & F, C and A
Note: Students lacking XIII MAT B or A may enrol if they take a special tutorial in the first term.
- MAT 140 Linear Algebra and Geometry** 2L:TR11, 1T:F4-6
 Groups—Basic definitions, Lagrange's theorem, factor groups, isomorphism theorem, existence of A_n , Geometry—Equations of lines and planes, quadric surfaces. Linear Algebra—Basic definitions, theorems about dimension and basis, abstract linear transformations, matrices, change of basis, dual space, determinants, linear equations, eigenvalues, eigenvectors, inner product spaces, orthonormal basis, reduction of symmetric matrix.
Exclusion: MAT 224F/225
Prerequisite: XIII MAT A and B/R & F, C and A

- MAT 150 Analysis I** 2L:TR10, 3T:F2-5
 Basic concepts of calculus: Axioms for the real numbers. Limits and continuity; intermediate value theorem. The derivative; the integral; the fundamental theorem. Mean value and extreme value theorems. Elementary transcendental functions; Taylor's theorem. Techniques in differential equations. Convergence. Power Series.
Exclusion: MAT 110/130/134/135/139
Prerequisite: XIII MAT A and B/R & F, C and A
- MAT 210F Introduction to Integral Calculus** (Not offered 1973-74) 2L, 2T
 Techniques of integration, applications. Series expansions.
Exclusion: MAT 130/134/135/139/150
Prerequisite: MAT 110
- MAT 220 Development of Analysis** 2L, 1T:MWF11
 Brief survey of Greek and mediaeval mathematics. Newton-Leibniz calculus. 18th and 19th century rigour and extensions. Detailed look at some mathematical examples.
Prerequisite: Any MAT course
Co-requisite: Any calculus course
- MAT 224F Intermediate Linear Algebra** 2L, 2T L:TR1, T1:F4-6, T2:F12-2
 Determinants, linear equations, quadratic forms and their geometrical interpretation, spectral theorem. (MAT 224F covers the same material as the latter half of MAT 225.)
Exclusion: MAT 140/225
Prerequisite: MAT 139
- MAT 225 Linear Algebra** 2L:TR1, 2T:F4-6
 Vector spaces, linear transformations, matrices and determinants, linear equations, quadratic forms and their geometrical interpretation.
Exclusion: MAT 140/224F
Prerequisite: XIII MAT A/R & F/MAT 110
- MAT 230 Advanced Calculus** 2L, 1T:MWF2
 A continuation of MAT 130. The definite integral, expansion in series, partial differentiation, multiple integration, differential equations.
Exclusion: MAT 234/235/239/250
Prerequisite: MAT 130/134/135/139/150/210F
Note: In 1973-74 only, MAT 110 will be accepted as a prerequisite
- MAT 234 Advanced Calculus for Social Scientists** 2L, 1T:MWF2
 Introduction to sequences and series, power series, Taylor's series in one and many variables. Extremal problems in many variables with and without constraints, Lagrange multipliers, reduction of quadratic forms. Introduction to difference and differential equations, emphasizing linear equations with constant coefficients.
Exclusion: MAT 230/235/239/250
Prerequisite: MAT 134/135/139/150
- MAT 235 Advanced Calculus for Scientists** 2L, 1T:MWF2
 Sequences and series. Differential and integral calculus of functions of several variables. Line and surface integrals. Ordinary differential equations. Emphasis throughout on applications.
Exclusion: MAT 230/234/239/250
Prerequisite: MAT 134/135/139/150

- MAT 239 Analysis** 2L, 1T:MWF2
 Sequences and series. Differential and integral calculus of vector valued functions of a vector variable, with emphasis on vectors in two or three dimensional Euclidean space. Extremal problems; Lagrange multipliers; line and surface integrals; vector analysis; Stokes' theorem; Fourier series. (This course attends to careful formulation of results, with less emphasis on proofs. Fulfills Physics prerequisites.)
Exclusion: MAT 230/234/235/250
Prerequisite: MAT 139/150
- MAT 240F Linear and Multilinear Algebra** 2L, 1T:MWF12
 Categories, rings, modules; multilinear algebra (tensors, tensor algebra, universal property, Grassman space, exterior algebra, determinant), canonical forms, spectral properties.
Prerequisite: MAT 140
- MAT 244F Ordinary Differential Equations** 2L, 1T:MWF9
 Ordinary differential equations of the first and second order, existence and uniqueness; solution by series and integrals; linear systems of first order; difference equations; numerical methods.
Exclusion: APM 251/331F
Prerequisite: MAT 139/150
Co-requisite: MAT 239
- MAT 245S Geometry I** 2L, 1T:MWF12
 Vector, affine, projective spaces; semi-linear mappings, geometric interpretation. Desargues' theorem, Pappus' theorem, dualities, polarities, quadratic and bilinear forms. Orthogonal and symplectic geometry; isometries, Witt's theorem, isotropic subspaces, involutions. Sylvester's theorem. Clifford algebras.
Reference: Artin, *Geometric Algebra*
Prerequisite: MAT 240F
- MAT 250 Analysis II** 2L, 1T:MWF2
 Topology of E_n , the real number system, compactness, connectedness, completeness; uniform continuity. Differential calculus of vector valued functions of a vector variable, including implicit and inverse function theorems. Lagrange multipliers. Integration, transformation and evaluation of multiple integrals, Riemann-Stieltjes integration. Calculus of differential forms. Integration of forms, line and surface integrals, Stokes' theorem.
Exclusion: MAT 230/234/235/239
Prerequisite: MAT 150 and MAT 140
- JLM 280 Introduction to Mathematical Linguistics**
 (See JLM under "Joint Courses")
- MAT 300 Algebra** 2L, 1T:MWF11
 Number systems, groups, rings, fields, and perhaps some applications.
Exclusion: MAT 340/345
Prerequisite: One previous MAT course
- MAT 309S Set Theory and Logic** 2L, 1T:MWF10
 An introduction to classical set theory and logic. Topics will include cardinal and ordinal arithmetic, axiom of choice, Boolean algebra, and informal first-order logic.
Prerequisite: MAT 150/234/235/239

- MAT 314F Point-Set Topology** 2L, 1T:MWF2
 Brief review of set theory. Elementary topology, metric spaces, convexity in linear spaces, fixed point theorems.
Exclusion: MAT 350
Prerequisite: MAT 230/234/235/239/250
- MAT 319S Introduction to Complex Analysis** 2L, 1T:MWF2
 Cauchy's theorem, residue calculus, conformal mappings, an introduction to Fourier series.
Exclusion: MAT 330/334F
Prerequisite: MAT 230/234/235/239/250
- MAT 320 20th Century Mathematics** 2L, 1T:MWF1
 A survey of the different trends in the mathematics of this century, their interplay, social function and effects in science and technology. A selection of topics from: foundations of mathematics, computer science, analysis, algebra, topology, geometry, probability and statistics; applications to physics, economics, biology, social and political science.
Prerequisite: A full calculus course, a half linear algebra course plus two full courses in university mathematics. MAT 220 is recommended.
- MAT 324F Geometry II** 2L, 1T:MWF2
 Generators and relations of orthogonal groups. Geometry of finite vector spaces. Abstract projective spaces and their collineations. Co-ordinatization of projective spaces. Representation of collineations by semi-linear maps. Representation of polarities by forms. Inversive planes.
Prerequisite: MAT 245S
- MAT 325 Geometry** 2L, 1T:MWF9
 Introduction to Euclidean geometry, with emphasis on the axiomatic method, modification of the axioms to yield projective, affine and non-Euclidean forms of geometry.
Reference: H.S.M. Coxeter, *Introduction to Geometry*
Prerequisite: MAT 140/224F/225
- MAT 330 Complex Analysis** 2L, 1T:MWF2
 Complex plane and Riemann sphere; the Mobius group. Elementary functions; analytic functions, elementary conformal mapping. Cauchy's integral formula and its consequences. The residue calculus. Taylor and Laurent series; infinite products. Riemann mapping theorem. Elliptic functions. Harmonic functions; the Dirichlet problem. Analytic continuation; monodromy theorem. Linear differential equations.
Exclusion: MAT 319S/334F
Prerequisite: MAT 250
- MAT 334F Complex Variables** 2L, 1T:MWF2
 Theory of functions in one complex variable; analytic and meromorphic functions; Cauchy's theorem, residue calculus, conformal mappings; introduction to analytic continuation.
Exclusion: MAT 319S and MAT 330
Prerequisite: MAT 239/250
- MAT 340 Algebra I** 2L, 1T:MWF11
 An introduction to the central ideas of modern algebra, including the structure of groups, rings, modules, and fields; Galois theory; Wedderburn's theorem.
Reference: S. Lang, *Algebra*
Exclusion: MAT 300/345
Co-requisite: MAT 240F

- MAT 344S Introduction to Combinatorics** 2L:R4-6, 1T:N
Elementary topics from three areas of discrete mathematics: maps, graphs, parentheses and enumeration; max.-min. (bottleneck) problems; trees, games and independence.
Prerequisite: MAT 140/224F/225
- MAT 345 Algebraic Structures** 2L, 1T:MWF11
A survey course in modern algebra including set theory, elementary number theory, groups, rings, polynomials, fields.
Exclusion: MAT 300/340
Prerequisite: MAT 140/224F/225
- MAT 350 Real Analysis** 2L, 1T:MWF12
Sets and Cardinals; Schroder-Bernstein theorem. Metric spaces. General topology: topological spaces, continuous maps; nets or filters; product, quotient and sub-spaces. Separation axioms, connectedness, compactness, paracompactness, Tychonoff's theorem. Completion of metric spaces. Normed linear spaces; duality. Introduction to Lebesgue integration in E^n . Function spaces. Hilbert spaces; compact operators; integral equations.
Exclusion: MAT 314F/APM 446S
Prerequisite: MAT 250
- MAT 364F Differential Geometry** 2L, 1T:MWF10
Differential geometry of curves and surfaces in E^3 . Fundamental theorem of curves, fundamental forms of surfaces, equations of Gauss and Codazzi, constant Gauss curvature and minimal surfaces, parallel transport, the theorem of Gauss-Bonnet.
Prerequisite: MAT 230/234/235/239/250 and MAT 140/224F/225
- MAT 399Y Independent Work in Mathematics** N
This course is designed for students who intend to pursue a career in mathematics. A prospective student should select his topic and adviser before the end of second year and discuss the topic with his adviser. The grade for the course will be based on the student's written report to be submitted by March 1.
Prerequisite: Consent of the Undergraduate Secretary and adviser.
- MAT 404F Foundations** 2L, 1T:TR10, R11
Provability, truth, computability; introduction to formal logic, model theory and recursion theory and their applications to the foundations of mathematics.
Prerequisite: MAT 309S
Co-requisite: MAT 340/345
- MAT 409S Mathematical Models in Linguistics** (Not offered 1973-74) 2L, 1T
The applications of mathematics to linguistics and the study of languages, in particular combinatorial applications, generative grammars, statistics of language, typology and style and topics of interest from current literature. (To be offered in alternate years.)
Prerequisite: MAT 140/300/345
Co-requisite: LIN 100 (or reading assigned by the instructor)
- MAT 414F Introduction to Number Theory** 2L, 1T:MWF3
Elementary topics in number theory to include: arithmetic functions; polynomials in many variables over the residue classes mod m , in particular Chevalley's Theorem; characters on the residue classes modulo m ; character sums and the quadratic reciprocity law; representation of numbers as sums of squares.
Prerequisite: MAT 230/234/235/239/250 and MAT 140/224F/225/300
- MAT 419S Number Theory** 2L, 1T:MWF3
Topics in analytic and algebraic number theory.
Prerequisite: (MAT 345 and 414F)/340

- MAT 420 History of Mathematics** 2L:M7.30-9:30p.m.
 The major emphasis is on the period since 1800 and on developing skill in information retrieval. Students will do general historical reading and will write papers on individually chosen topics.
Prerequisite: Six courses in university mathematics.
- MAT 425 Algebraic Topology** 2L:TR3, 1T:W4
 Basic concepts of algebraic topology, homotopy, cohomology with applications.
Reference: Maunder, *Algebraic Topology*
Prerequisite: MAT 350 and MAT 240F/340
- MAT 429S Algebraic Geometry** 2L, 1T:N
 Theory of algebraic curves and surfaces; projective and affine varieties; study of singularities.
Prerequisite: MAT 245S/325
- MAT 434F Advanced Complex Analysis** 2L, 1T:MWF10
 Riemann surfaces, covering spaces, Picard Theorem, $\bar{\partial}$ -cohomology, Riemann-Roch theorem, sheaves, analytic continuation in one and several complex variables.
Prerequisite: MAT 330
Recommended preparation: MAT 465F
- MAT 435 Theory of Differential Equations** 2L, 1T:MWF9
 Ordinary differential equations; existence theorems, non-linear systems, boundary value problems, Sturm-Liouville theory. Integral equations; Fredholm theory. Linear partial differential equations of the second order.
Prerequisite: MAT 250 and APM 251
- MAT 444F Homological Algebra** 2L:TR2, 1T:F1
 Tensor product of modules; the functors Tor and Ext: Exterior algebra over a module; chain complexes, homology, cohomology; the Kunneth sequences, universal coefficient theorem; exact sequences; global dimension.
Prerequisite: MAT 240F
Recommended preparation: MAT 340/345
- MAT 449S Algebra II** 2L:TR2, 1T:F1
 Topics in algebra (at most two) to be selected in consultation with the students from: commutative algebra; field theory; group theory; Lie algebras; invariant theory.
Prerequisite: MAT 340
- MAT 454F Abstract Integration Theory and Applications** 2L, 1T:MWF11
 Treatment of abstract theory; Haar measure; probability and infinite product measures; function spaces (L_p and Wiener integral); Fourier Series and harmonic analysis; Ergodic theory.
Prerequisite: MAT 350
- MAT 459S Functional Analysis** 2L, 1T:MWF11
 Fundamental properties and theorems of Banach spaces and Banach algebras; Gelfand Representation Theorem; systematic study of the projections in Hilbert spaces; spectral theorem for bounded normal operators.
Prerequisite: MAT 350

- MAT 464F Combinatorial Theory** 2L, 1T:N
Advanced topics in discrete mathematics chosen from the following areas: graphs, maps, bottleneck problems, linear programming, enumeration, dependence, block designs and difference sets.
Prerequisite: MAT 340/344S/345/CSC 348F
Recommended preparation: MAT 344S
- MAT 465F Geometry of Smooth Manifolds, I** 2L, 1T:MWF10
Manifolds, tensor fields, Riemannian metrics, connexions, parallel transport and geodesics, exterior and Lie derivatives, curvature.
Prerequisite: MAT 240F and MAT 250
- MAT 469S Geometry of Smooth Manifolds, II** 2L, 1T:MWF10
A continuation of MAT 465F. Equations of structure and completeness, hypersurfaces in E^n , curvature, fundamental theorem of surfaces. Gauss-Bonnet, integration and De Rham cohomology.
Prerequisite: MAT 465F
- MAT 470F/473F/474S/475S/478/479/498 Advanced Topics** 2L, 1T:N
Graduate level courses in Algebra, Analysis, Foundations, Geometry, Topology, or Manifold Theory.
Co-requisite: Three other 400 level courses in mathematics: consent of the Instructor and the Undergraduate Secretary of the Department is required.
- MAT 499 Readings in Mathematics** N
Students enrolling in this course will do independent study in mathematics under the direction of a faculty member. Persons wishing to take this course must have the consent of the Undergraduate Secretary in Mathematics and of the prospective supervisor.

MEDICINE - See BCH under "Biochemistry"
CLB under "Clinical Biochemistry"
PCL under "Pharmacology"
PSL under "Physiology"

MBL**MICROBIOLOGY**

Given by Members of the School of Hygiene

<i>Acting Chairman of the Department:</i>	Professor R. Pakula
<i>Undergraduate Secretary:</i>	Professor J.F.M. Hoeniger
<i>Enquiries:</i>	150 College St., Room 54A (928-2760)

Microbiology, a branch of the biological sciences, deals in particular with bacteria and viruses. Though the study of algae and fungi and of protozoa lies in the realms of Botany and Zoology, a microbiologist should have a wide understanding of all forms of unicellular life.

The agents of early pestilences and plagues were bacteria and viruses although the disasters were ascribed to the wrath of the gods, the punishment of sinners or, more practically, the evil vapours from stagnant waters. These disasters ranged from the plagues of Egypt in Biblical times to the Black Death of the fourteenth century. It was not until 1676 that bacteria were first seen and almost two centuries later that they were recognized as free-living organisms. Viruses, because of their small size (the poliovirus is a thirty thousandth of a millimetre in diameter) were not seen until this century, and then only as a result of the development of the electron microscope.

Once the free-living and infectious nature of bacteria was recognized, and the parasitic mode of life of viruses had been discovered, much research was directed towards the eradication of disease. This led to the development of immunology, a field which forms an important part of a microbiologist's

training. Immunology is the study of techniques whereby one can recognize and develop protection against infectious agents. But only a small proportion of bacteria are pathogenic. While the Egyptians were suffering the plagues, they were also making wine, beer and fermented milks, all of which depend on micro-organisms.

The importance of micro-organisms in soil fertility, plant deterioration, metal and stone corrosion, sewage disposal, alcoholic fermentation, production of enzymes and amino acids, steroid conversion, and even as a potential food source has only recently been exploited. This can be seen in the new technology of the food industry. Sewage disposal and oil decomposition are at present ecological problems whose solution requires microbiological knowledge.

A thorough understanding of the chemical processes of living organisms is essential for a microbiologist. The central position of the microbe as a biochemical tool is realized if an examination is made of the most recent advances in biology. Clearly, the student of modern microbiology requires some understanding of chemistry and biochemistry. Equally clearly, the biological scientist, without some microbiological experience, is at a disadvantage.

Careers of microbiologists are in research, in hospital and public health laboratories, and in the food and pharmaceutical industries. Such careers require specialization at the undergraduate level. The student should enrol in courses listed under the heading "B.Sc. Programmes". Students wishing to enter the field of public health may proceed to the Diploma in Bacteriology after a four year degree. Undergraduate research projects and advanced degrees may be undertaken in a variety of subjects: structure of bacteria and viruses; pathology of animal viruses; transfer of genetic material between bacteria, and between viruses and bacteria; taxonomy of bacteria and the ecological and pathological significance of certain genera; bacterial physiology and the biochemical basis of antibiotic action.

Counsellors are available throughout the year and appointments can be made through the departmental secretary in Room 54A, School of Hygiene (928-2760). A departmental brochure designed for graduate students is available in the Library, School of Hygiene. Specific details regarding undergraduate courses can be obtained from the appropriate instructors.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- MBL 200 Introductory Microbiology** 2L, 2P:TR9-11
 A course designed to introduce students to the study of bacteria, fungi and viruses. The properties of the organisms such as their structure, growth, metabolism and nutrition, immunity mechanisms, and pathogenicity will be covered. Selected species will be used to demonstrate the significance of micro-organisms in medicine, industry and agriculture.
P. L. Seyfried.
 Enrolment limited to 130.
Prerequisite: BIO 100/110/120, CHM 120

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- MBL 300Y Pathogenic Microbiology** 2L:TR11
 A course on the phenomena of infection by pathogenic bacteria, rickettsiae and viruses.
L. W. Macpherson.
- MBL 320 General Bacteriology** 2L:MW9, 4P:MW10-12
 A course offering a basic approach to various areas of bacteriology, including structure, growth, physiology and genetics of bacteria. Enrolment limited to 40. *J.F.M. Hoeniger.*
Exclusion: BIO 370E (Erindale)
Co-requisite: BCH 320/321
- JBM 350 General Virology**
 (See under JBM "Joint Courses")

COURSES OPEN TO FOURTH-YEAR STUDENTS

- MBL 422 Project in Microbiological Research** 6P:N
A course for students wishing to receive practical experience in microbial research with an investigator in the department.
Prerequisite: Consent of the professor supervising the project. Open only to students with A or B standing in the previous year.
- MBL 424F Microbial Genetics** 2L:M9, W12
The central theme of the course is the study of molecular genetics of bacteria and their viruses. The subject matter includes structure and function of nucleic acids, the genetic code, the mechanism of protein synthesis and its control, structure and replication of DNA and RNA bacterial viruses, molecular aspects of mutation, extrachromosomal genetic elements and genetic transfer in bacteria. *R.Pakula.*
Prerequisite: BCH 320/321; MBL 320/JBM 350
- MBL 425S Experiments in Microbial Genetics** 2P:R1-3
The experiments include the effects of ultraviolet light (UV) on bacteria, photoreactivation of UV-induced lesions, induction, isolation and identification of auxotrophic mutants of *Escherichia coli*, illustration of various mutation in bacteriophage, transfer of genetic information as in bacterial conjugation, transduction and transformation, hybridization of DNA extracted from related species of bacteria and determination of its biological activity. Enrolment limited to 20. *R.Pakula.*
Prerequisite: BCH 320/321; MBL 320/JBM 350; MBL 424F
- MBL 430 Immunology** 1L:W2, 2P:W3-5
A course on the basic principles of immunology and immunochemistry including antigen-antibody reactions, chemical nature of antigens and antibodies, hypersensitivity, and blood groups. Enrolment limited to 50. *M. Goldner*
Prerequisite: None. BCH 320/321 recommended.
- MBL 431F Systematic and Applied Virology** 2L:TR12, 3P:T2-4, F3
A course covering the major groups of animal viruses with respect to their physiochemical characteristics, replication, and methods of isolation and identification. The laboratories will provide experience in the propagation and maintenance of cell cultures, and their use in diagnostic virology. Enrolment limited to 20. *F.W. Doane*
Prerequisite: JBM 350
Co-requisite: MBL 300Y
- MBL 432S Systematic and Applied Bacteriology** 2L:TR12, 3P:T2-4, F3
A course on the differentiation and classification of pathogenic bacteria, and on microorganisms of importance in the fields of industry, food and agriculture. Enrolment limited to 20. *P.L. Seyfried.*
Prerequisite: MBL 320

MMS**METALLURGY AND MATERIALS SCIENCE**

Given by Members of the Faculty of Applied Science and Engineering

Chairman of Department:

Professor C.B. Alcock

Departmental Counsellor:

Professor K.T. Aust

Enquiries:

Wallberg Building, Room 101 (928-5004)

The Department of Metallurgy and Materials Science offers several courses intended to provide a basic understanding of the relationship between the structure and properties of a wide range of materials. These courses in general treat materials from the atomistic and microstructural standpoints

and draw heavily on both physics and chemistry; they should therefore be of interest to students intending to follow careers in the teaching of science or in industrial science.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- MMS 223S Materials Science** 3L:MWF10, 1½P:T2-5
 The effects of microscopic and atomic structures on the properties of engineering materials. The topics covered include atomic bonding and structure of materials, diffusion, crystal growth and solidification, plastic deformation and annealing, precipitation hardening, phase transformations especially in ferrous materials, relationships between structures and mechanical properties of metallic and non-metallic materials, and composite materials. The laboratory experiments are designed to illustrate the principles underlying the relationship between structure and properties of engineering materials and are given in alternate weeks.
Prerequisite: CHM 120, Departmental approval
Co-requisite: PHY 230/250

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- MMS 303F Physical Metallurgy** 3L:TR11, W10, 3P:F2-5
 An introduction to the fundamental basis of microstructure control stressing the importance of alloying, plastic deformation and annealing. The principles of solidification, crystal growth, and phase transformations in solids, with particular reference to steels, are considered in detail.
Prerequisite: (PHY 250, 252F)/MMS 223S, Departmental approval
Co-requisite: PHY 334F/445 for those without MMS 223S
- MMS 304S Physics of Metals** 3L:TR9, W1, 3P:T2-5
 Plastic deformation and mechanical properties are discussed in terms of dislocation theory. The annealing processes of recovery, recrystallization and grain growth and the structure and properties of interfaces in materials are also considered.
Prerequisite: MMS 303F
- MMS 307S Materials Science** 3L:N
 The course deals with the relationship between the structure and properties of non-metallic solids. Topics to be discussed are: thermodynamics and kinetics of phase transitions, phase diagrams, diffusion, crystal defects, and the effect of structure on physical, chemical and mechanical properties.
Prerequisite: MMS 223S, CHM 220/221

COURSES OPEN TO FOURTH-YEAR STUDENTS

- MMS 411S Advanced Materials Science** 3L MWF11, 3P:M2-5
 This course is offered to those students whose primary interest lies in the research aspects of materials. Recent developments in materials science are discussed in fields such as crystal growth, purification of materials, high-vacuum studies, preparation and characterization of clean surfaces, interfacial structure and properties, Auger emission and impurity segregation, environmental interactions. The laboratory work consists of research projects on contemporary problems in the field of materials science.
Prerequisite: MMS 304S/MMS 307S

MUS

MUSIC

Given by members of the Faculty of Music

Faculty of Music Representative:

Professor T. Kenins

Enquiries:

Edward Johnson Building (928-3740/3741)

In the Faculty of Arts and Science, music is approached as one of the liberal arts and taught as cultural history. A wide range of courses explores the art and folk music of western and non-western cultures;

courses in theory and composition provide the craft and analytical tools needed for most of the upper year electives. The full programme seeks to give a balanced view of the world literature of music and is excellent preparation for graduate studies in musicology and ethnomusicology; but it differs in many respects from programmes leading to the Bachelor of Music degree, for which students should consult the Calendar of the Faculty of Music.

The humanistic and historical approach aims for a high degree of correlation with other disciplines of the Faculty of Arts and Science. To mention only a few possibilities, students of Fine Art will find fruitful parallels in MUS 100, 201 and 301; students of cultural anthropology should benefit greatly from MUS 200 and 443; students of languages and literatures will be interested to investigate how word and music interrelate in music and theatre, church music and song (MUS 301, 400, 401); while almost any student in the University who enjoys music will find MUS 100 a stimulating and critical introduction to world music.

Two courses (MUS 100, 200) are available without pre-requisite and without prior musical training; others (MUS 201, 300, 301, 400, 401) require only the pre-requisite of MUS 100.

Students who wish to enter a specialist programme, however, must demonstrate that they can read and perform music and that they have a knowledge of musical grammar (see these requirements under MUS 140). The fifteen available places in MUS 120 and 140 are allocated early in registration week. Please consult the Secretary of the Faculty of Music in the Edward Johnson Building for the place and time of the tests which determine this allocation.

Because many music courses have limited enrolments and are offered on an irregular basis, it is imperative to plan a year or two in advance and to pre-register whenever possible.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

MUS 100 **The Study of Music Literature**

2L, 1T L1:MW9, L2:MW11, L3:MW12, L4:W7.30-9.30p.m.T:N

An introduction to world music dealing with the repertory of western music from the Middle Ages to the 20th century, non-western music of high civilizations, and popular music. Discussion of form, style and the inter-relationship of music and culture. Required listening and reading lists are distributed at the beginning of the year.

Exclusion: MUS 122 (1972-73)/120

MUS 120 **History of Music I** (Formerly MUS 122)

3L L1:MWF9, L2:MWF10

The study of music as a literature: the major styles and forms of western music from the Middle Ages to the Baroque. Enrolment limited to 15 students.

Reference: Apel, *Harvard Dictionary of Music, complete edition* (Harvard); Grout, *A History of Western Music revised* (Norton); *Historical Anthology of Music*, Volume I or II (Harvard).

Exclusion: Mus 100

Co-requisite: MUS 140

MUS 140 **Materials of Music I**

4P:N

Harmony: triads, non-harmonic materials, dominant seventh and derivatives, secondary dominants, simple modulation. Elementary forms, and analysis of 18th- and 19th-century literature. Sight singing; melodic, rhythmic and harmonic dictation. Keyboard harmony: chords and scales in all major and minor keys; playing of cadence types; modulation to closely related keys; realization of elementary figured bass. Two-part transposition; and score reading in five clefs. Sight harmonization of simple melodies.

Exclusion: MUS 120 (1971-72 or earlier)

Prerequisite: Students wishing to enter MUS 140 must demonstrate that (a) they possess the ability to read and perform music and (b) they have a knowledge of musical grammar. To satisfy (a) they should be prepared to play for an audition pieces equivalent to those required for a grade VIII examination of the Royal Conservatory of Music at Toronto. To satisfy (b) they may submit certificates of the Royal Conservatory of Music of Toronto showing successful completion of Grade II theory and Grade III harmony or their equivalent, or may ask for a special examination. Enrolment limited to fifteen students.

Co-requisite: MUS 100/120/122 (1972-73)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- MUS 200 **The Music of the World's Peoples** (Formerly MUS 423) 3L:MWF3
A non-specialist introduction to the major musical cultures of the world. Comparative study of musical materials (melody, scales, rhythm and form), singing styles and instruments.
- MUS 201 **Music in the Contemporary World** (Formerly MUS 223) (Not offered 1973-74) 2L
The modern repertoire, including electronic, non-western, and popular music developments. A non-specialist view of recent historical, theoretical, technological, and social advances in music.
Exclusion: MUS 222
Prerequisite: MUS 100 or permission of instructor
- MUS 220 **History of Music II** 3L:N
Music from the "classic" period to the present viewed as a continuous and unbroken tradition; non-western music of high civilizations and popular music.
Reference: Texts of MUS 120 and Charles Rosen, *The Classical Style* (Norton); Longyear, *Nineteenth-Century Romanticism in Music* (Prentice-Hall); Salzman, *Twentieth-Century Music* (Prentice-Hall).
Exclusion: MUS 100
Prerequisite: MUS 122 (1972-73)/120
Co-requisite: MUS 240
- MUS 222 **History and Literature of Music I** 2P, 2T P1:M2-4, T1:R10-12, T2:W4-6
Study of the 17th and 18th centuries, including topics for individual research. Research methods and music bibliography, music editions, sources and reference works.
References: selected scores and Duckles, *Music Reference and Research Materials*, 2nd edition (Free Press).
Prerequisite: MUS 100/122 (1972-73)/120, 140
- MUS 240 **Materials of Music II** 2L, 2P:N
Chromatic harmony and an introduction to twentieth century techniques. Extended forms and analysis of 19th- and 20th-century literature. Keyboard harmony, improvisation, altered chords, sight harmonization, figured bass in baroque style, advanced transposition; three-part score reading in five clefs, transposing instruments and simple string quartet scores. Sight singing and dictation.
Prerequisite: MUS 100/120/122 (1972-73), 140
Co-requisite: MUS 222
- MUS 300 **Instrumental Music** (Formerly MUS 323) 2L:MW4
Masterpieces of orchestral, ensemble, and solo music since the eighteenth century; relationship between the repertoire and the instruments of performance.
Exclusion: MUS 222
Prerequisite: MUS 100/120/122 (1972-73), or permission of lecturer
- MUS 301 **Early Music** (Not offered 1973-74) 2L
The eastern and western sources of the European tradition in music; sacred and secular music of the middle ages and renaissance.
Exclusion: MUS 222
Prerequisite: MUS 100/120/122 (1972-73), or permission of lecturer
- MUS 322 **History and Literature of Music II** 2S:F12-2
Study of the 19th and 20th centuries, including topics for individual research.
References: Austin, *Music in the 20th Century* (Norton); selected scores.
Prerequisite: MUS 222, 240

- MUS 325 **Music of North America** 2S:N
 Music of the New World from the early settlers to the 20th century. (Not offered 1974-75).
Reference: Hitchcock, *Music in the United States* (Prentice-Hall); Kallmann, *A History of Music in Canada, 1534-1914* (Toronto).
Prerequisite: MUS 222, 240, or permission of lecturer
- MUS 327 **Musical Acoustics** (Formerly MUS 343Y) 1S S1:T3, S2:T4
 Physical and physiological determinants of sensations of sound. Properties of sound. Formation of scales and tone systems. Problems of tuning and temperament.
Reference: Bartholomew, *Acoustics of Music* (Prentice-Hall)
Prerequisite: MUS 222, 240
- MUS 340 **Counterpoint** 2S S1:MW12, S2:MW1
 Counterpoint in the 16th- and 18th-century style and fugue.
Prerequisite: MUS 222, 240
- MUS 341 **Composition** (Formerly MUS 241) 2S:N
 The small forms for piano, voice, and solo instruments.
Prerequisite: MUS 240
- MUS 344Y **Keyboard Harmony** 1S:N
 Advanced work in specialized fields of harmony, improvisation, and score reading (including vocal and orchestral scores).
Prerequisite: MUS 222, 240
- MUS 345 **Orchestration** 1S:N
 Scoring for full orchestra. Special problems of piano transcription. Study of selected scores.
Prerequisite: MUS 222, 240
- MUS 350F **Jazz** 2S:N
 The present and past influence of jazz, its origins and history; its role in shaping musical traditions of the present, both "classical" and popular; its social impact. (Offered 1973-74 only.)
Reference: Marshall Stearns, *The Story of Jazz*
Prerequisite: MUS 222, or permission of lecturer
- MUS 351S **Music in Britain** (Formerly MUS 331F) 2S:N
 The British "renaissance" of musical composition beginning in the second half of Victoria's reign: Sullivan, Parry, Stanford, Elgar, Vaughan Williams, Holst, Walton and Britten. (Offered 1973-74 only.)
Prerequisite: MUS 222, or permission of lecturer
- MUS 352F **Chamber Music** 2S:N
 The "intimate art" of the musical amateur from the renaissance to the present with emphasis on the late eighteenth century. (Offered 1973-74 only.)
Prerequisite: MUS 222, or permission of lecturer
- MUS 353F **Opera** (Formerly MUS 429S) (Not offered 1973-74) 2S
 From *Orfeo* to *Electra* with emphasis on the role of the "supernatural" and the "exotic"; literary background, staging and musical setting. (Offered 1974-75 only.)
Reference: Kerman, *Opera as Drama* (Vintage)
Prerequisite: MUS 222, or permission of lecturer

- MUS 354S **Russian Music in the 19th Century** (Not offered 1973-74) 2S
Musical nationalism from Glinka to Glazunov with emphasis on the "Five"; Tchaikovsky.
(Offered 1974-75 only.)
Prerequisite: MUS 222, or permission of lecturer
- MUS 355F **Studies in the History of Music in Canada** (Formerly MUS 330F) (Not offered 1973-74) 2S
The background and development of musical life in Canada. Texts: H. Kallmann, *A History of Music in Canada 1534-1914*; A. Walter, *Aspects of Music in Canada*.
Prerequisite: MUS 222, or permission of lecturer
- MUS 356F **Song** (Formerly MUS 332F) (Not offered 1973-74) 2S
European folk and art traditions in the larger context of world-wide song and European instrumental music. The monophonic and polyphonic song from the Middle Ages to the 17th century.
Prerequisite: MUS 222, or permission of lecturer
- MUS 357S **Impressionism and Expressionism** (Formerly MUS 427S) (Not offered 1973-74) 2S
French and German music from the death of Wagner to World War II. Emphasis on the many artistic "isms" of the early 20th century.
Prerequisite: MUS 222, or permission of the lecturer
- MUS 400 **Music and Theatre** 2L:N
Music in the medium of the Theatre—dance, play, opera and film—from the medieval to the contemporary world.
Exclusion: MUS 222
Prerequisite: MUS 100/120/122 (1972-73), or permission of lecturer.
- MUS 401 **Wagner** (Not offered 1973-74) 2L
A study of the works of Richard Wagner and his dominant position in the artistic life and thought of the nineteenth century.
Exclusion: MUS 222
Prerequisite: MUS 100/120/122 (1972-73) or permission of lecturer.
- MUS 422 **History and Literature of Music III** 2L:MF11, 2P:W11-1
Study of the Middle Ages and Renaissance, including topics for individual research; the notation of early music.
References: Crocker, *History of Musical Style* (McGraw-Hill); Reese, *Music in the Middle Ages*, and *Music in the Renaissance* (Norton); Sparks, *Cantus Firmus in Mass and Motet* (U. of California Press); Apel, *The Notation of Polyphonic Music* (Medieval Academy); Parrish, *The Notation of Medieval Music* (Norton).
Prerequisite: MUS 222, 240
- MUS 441F **Analytical Technique** 2S:N
Harmonic, contrapuntal and structural analysis of selected works from Bach to the end of the 19th century.
Prerequisite: MUS 222, 240
- MUS 442S **Contemporary Analysis** 2S:N
Analysis of selected 20th-century works.
Prerequisite: MUS 222, 240

- MUS 443 Introduction to Ethnomusicology** 2S:MW3
 Descriptive and comparative studies of traditional musics, including tribal and oriental cultures and western folk idioms. Analysis and transcription of field recordings. Methods employed in this research.
Reference: Nettl, *Theory and Method in Ethnomusicology* (Free Press of Glencoe)
Prerequisite: MUS 222, 240, 343Y (1972-73 and earlier)/327
- MUS 450S Musical Criticism: Aesthetics and Analysis** (Formerly MUS 329S) 2S:N
 An investigation of tacit assumptions and concepts about analysis (structural elements of style: rhythm, melody, harmony, form) and aesthetics (value criteria of beauty, perception, significance, expression). (Offered in 1973-74 only)
Prerequisite: MUS 222 or permission of lecturer.
- MUS 451F Introduction to Performance Practices** 2S:N
 Source readings as aids to modern performance. (Offered 1973-74 only.)
Reference: Dorian: *The History of Music in Performance* (Norton)
Prerequisite: MUS 222, or permission of lecturer.
- MUS 452S Mozart** 2S:N
 A comprehensive survey of his works with emphasis on selected concertos, symphonies and operas. (Offered 1973-74 only.)
Prerequisite: MUS 222, or permission of lecturer.
- MUS 453S Plainchant** (Formerly MUS 333S) (Not offered 1973-74) 2S
 An introductory study, with emphasis on the musical characteristics of melody types and their relation to liturgical function; problems of origins and development, the manuscripts, notation, rhythmic theories, the 19th century revival. (Offered 1974-75 only.)
Reference: Apel, *Gregorian Chant* (Indiana); Reese, *Music in the Middle Ages* (Norton).
Prerequisite: MUS 222, or permission of lecturer.
- MUS 454F Beethoven** (Formerly MUS 424F) (Not offered 1973-74) 2S
 The late works: The "Ninth" Symphony and the Missa Solemnis, the sonatas and quartets; an introduction to the sketch books. (Offered 1974-75 only.)
Prerequisite: MUS 222, or permission of lecturer.
- MUS 455S The Italian Madrigal** (Not offered 1973-74) 2S
 Mannerism and the avant-garde in musical styles from 1530 to 1630. Interrelationships between poetry and music, intellectual ideas of radicalism in the arts, *maniera* and stylization in music. (Offered 1974-75 only.)
Prerequisite: MUS 222, or permission of lecturer.
- MUS 456S Music and Theatre in the 20th Century** (Formerly MUS 425F) (Not offered 1973-74) 2S
 All aspects of musical and visual associations—opera, drama, film, dance, "happenings", etc.
Prerequisite: MUS 222, or permission of lecturer.
- MUS 457F Preparing Early Music for Performance** (Formerly MUS 430S) (Not offered 1973-74) 2S
 A consideration of all aspects relating to the stages between original source and final sound. Notation will not be required. Experiments may be carried out in class.
Prerequisite: MUS 222 or permission of the lecturer

<i>Chairman of the Combined Departments:</i>	Professor E.G. Clarke
<i>Undergraduate Secretary:</i>	Professor J.S. Holladay
<i>Chairman of College Departments:</i>	
<i>University College:</i>	Professor R.F.G. Sweet
<i>Victoria College:</i>	Professor E.G. Clarke
<i>Enquiries:</i>	University College, Room B101 (928-3181) or Victoria College, New Academic Building, Room 324 (928-4979)

The Department of Near Eastern Studies is concerned with the story of man's first breakthrough from neolithic savagery to settled urban life, and the subsequent development of high civilizations in Egypt and the Tigris-Euphrates valley, and later in adjacent areas, down into the Christian era.

The point at which the department is content to have other departments, such as Classics, Islamic Studies, or History, take over the story is not easily fixed. The Assyriologist would certainly want that point placed well before the beginning of the Christian era. But some of the languages spoken in the older Orient, such as Hebrew or Syriac, continued to be used, at least in scholarly circles, even after the beginning of the Islamic age in the seventh century A.D. Important new contributions to the literatures of these languages were made in the Middle Ages, so that the Hebraist and Syriacist would insist that the upper temporal limit for the Department's activities be placed at least that late. Hebrew, indeed, has been revived within the past century as a living language, and thus in the case of Modern Hebrew studies, the concerns of the Department come right down to the present day.

The geographical scope of Near Eastern Studies is more easily defined. It comprises the area of modern Egypt, Israel, Jordan, Lebanon, Syria, Turkey, Iran, Iraq, and the Arabian peninsula, although the scholar in Near Eastern Studies may find his interests leading him to the Indus Valley, to Ethiopia, or, following the peregrinations of the Jewish people, to Europe.

Near Eastern studies clearly include a wide variety of disciplines. There is Archaeology, both for the prehistoric period when the archaeologist alone can reconstruct the story of man's doings, and for the historic periods when archaeologist and philologist work together, combining the evidence of tell and text to restore the fuller tale. The Near East is a particularly attractive area for the archaeologist because of its abundance of buried materials and the fact that it was here that man pioneered the path from barbarism to civilization. Archaeology includes not only the study of humble potsherds and crumbled walls, but of reliefs and wall paintings, architecture and sculpture, and other types of ancient art.

There is also Philology, the study of languages and documents with curious scripts—Egyptian with its hieroglyphs, the Babylonian and Assyrian dialects of Akkadian with its cuneiform writing, Hebrew, Aramaic and its graceful sister Syriac, and Hellenistic Greek (some other languages are taught only in the School of Graduate Studies). A knowledge of these languages is a key to the first-hand study of literatures far older than the Iliad or Odyssey. Egyptian stories like those of Sinuhe or Wen-Amon, or Babylonian compositions like the Gilgamesh and Creation Epics, hold honoured places in the history of world literature. The best known body of literature from the ancient Near East is, of course, the Jewish Bible, the Christian Old Testament, echoes of which are heard in all the great literatures of western civilization.

The findings of archaeologist and philologist provide the raw materials for the historian, who synthesizes the multifarious data and traces the broad patterns of events which the student of the ancient Near East must discern if he is not to be overwhelmed by the vastness of the time span with which he must reckon.

Why study civilizations so remote in time and place from one's own as those of the ancient Near East? The only adequate answer is that one finds them inescapably fascinating. But what good do such studies do? They provide the background and the depth in one's field of vision that are necessary if one would see western civilization in true perspective. Anyone curious about the deepest foundations of our own society should consider taking at least NES 100, and perhaps also a sequence in Near Eastern history in his Second and Third Years. The student interested in the westward shift of power from the Near East to Greece and Rome, and then to Europe, might combine courses in Near Eastern history

with others in Greek and Roman history and mediaeval European history. A person interested in the science of Archaeology can hardly omit to take at least one of NES 280, 281F, or 282S which can be combined with courses in Anthropology and Fine Art. Someone particularly interested in the Hebrew scriptures, the continuing fount of inspiration for both Judaism and Christianity, should take NES 101, 261 and 362 however distant their other studies are from the Near East.

The student who wishes to savour the taste of an original Near Eastern text with the full pungency that no translation can ever convey should tackle a language, such as Hebrew, either biblical or modern. A person specially interested in Judaism or early Christianity might add Aramaic or Hellenistic Greek—the languages of a large corpus of Jewish literature and of the New Testament respectively—to his study of Hebrew in his Second Year. Egyptian may be taken in the Second Year with no prerequisite, but some prior knowledge of Hebrew or Arabic is required for Akkadian, whose clumsy writing system does not adequately express some important features in the structure of the language, which must be reconstructed by analogy with other Semitic languages. A student who plans a career in Iraqi Archaeology and who wishes to study Akkadian might consider it more practical to take Arabic rather than Hebrew as his first Semitic language.

A student wishing to specialize in any of the generally recognized fields of Near Eastern Studies, such as Egyptology, Assyriology, Hebrew Studies, Near Eastern History, or Near Eastern Archaeology will find the regulations for the constitution of an appropriate programme sufficiently flexible to allow him to select courses directly relating to his interests, with a minimum of constraint to take subjects he may consider uncongenial or irrelevant. His choice of subjects, however, will best be made with the advice of the undergraduate secretary. He would do well to acquire a knowledge of German as early as possible, and not to neglect his French. Some knowledge of Anthropology will be useful by teaching him how best to approach archaic, non-western societies. A course or two in Linguistics will stand him in good stead.

An interdisciplinary programme in Ancient History can be created by combining courses in Near Eastern History with courses in Greek and Roman History offered by the Classics Department, preferably in conjunction with a course in Greek or Latin and another in a Near Eastern language. A programme in Archaeology can be formed by combining courses in Near Eastern History with a selection from the offerings of Anthropology and Fine Art. The student seriously interested in mediaeval Judaism should combine his study of Hebrew with as many as possible of Arabic, Islamic History and Institutions, Philosophy, Mediaeval European History, Latin, and Spanish or Italian. One interested in modern Hebrew literature should aim at a wide acquaintance with European literatures, particularly Russian and German.

To what kind of careers do programmes specializing in Near Eastern Studies lead? A good background in Hebrew and Near Eastern History will be of great value to candidates for the Rabbinate or Christian ministry. Other programmes naturally lead to careers in museum work, archaeology, or university teaching and research.

The student who has made up his mind to proceed to a graduate degree in a particular area of Near Eastern Studies will obviously want to follow an undergraduate programme in that same area. Suggested programmes in Jewish Studies and in Near Eastern Studies are given under the heading "B.A. Programmes" toward the front of the Calendar. But graduates with little background in their desired field of specialization are admitted to the Graduate Department of Near Eastern Studies, although their training must take longer than in the case of a person with more background. The undergraduate uncertain of where his interests really lie should therefore not rush into a premature specialization in this field.

The names of instructors assigned to teach courses in this Department are listed on departmental notice-boards at University College and Victoria College during the registration period.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- NES 100 **The Ancient Near East** 2L, 1T L1:MW2, T1:R2, T2:F1, T3:F2
 A general introduction to the archaeology, history, and literatures of the ancient Near East. Stress will be laid on the contributions made by the Egyptians, Babylonians, Assyrians and Hebrews to the development of civilization.
Exclusion: NES 271/272/371 may not be taken in the same year

- NES 101 **The Biblical World** 2L, 1T:MWF11
An introduction to the study of the Hebrew Scriptures (the Old Testament) against the background of Near Eastern civilization.
- NES 141 **Introductory Biblical Hebrew** 3S:MWF1
An introduction to biblical Hebrew prose. Grammar and selected texts. For students with no previous knowledge of Hebrew.
Exclusion: NES 142
- NES 142 **Introductory Modern Hebrew** 1L, 2P, 1T: Section 1 L1:M9, P1:TF9, T1:W9, T2:R9
Section 2 L2:M1, P2:TF1, T3:W1, T4:R1
Use of an audio-lingual approach: classroom exercises supplemented by drill in the language laboratory. May not be taken by students with Grade XIII Hebrew or whose knowledge of Hebrew is equivalent to or better than that required for Grade XIII Hebrew. Four sections with enrolment limited to 13 for each section.
Exclusion: NES 141
- NES 243 **Advanced Modern Hebrew**
- NES 244 **Newspaper Hebrew**
- NES 245 **Studies in Modern Hebrew Literature**
- NES 246 **Intermediate Biblical Hebrew (B)**
- NES 251 **Introductory Hellenistic Greek**
- NES 262 **Classics of the Jewish Tradition (in Translation)**

(These courses are described in the section which follows.)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- NES 211 **Introductory Akkadian** 3S:MWF11
Introduction to Old Babylonian. Grammar and reading of selected texts.
Prerequisite: Arabic or Hebrew, normally ISL 214/NES 141/142
- NES 221 **Introductory Aramaic-Syriac** 3S:MWF11
Introduction to Aramaic grammar. Readings from biblical Aramaic. Introduction to Syriac grammar. Readings from biblical Syriac.
Prerequisite: Hebrew, normally NES 141/142
- NES 231 **Introduction to Middle Egyptian** 3S:MWF11
Grammar and reading of selected hieroglyphic texts.
- NES 241 **Intermediate Biblical Hebrew (A)** 3S:MWF10
A continuation of NES 141. Grammar and rapid reading of selected biblical texts.
Prerequisite: NES 141 or permission of instructor
- NES 242 **Intermediate Modern Hebrew** 3S:MWF9
Continuation of NES 142. Analysis of examples of modern expository prose. Discussion of problems connected with vocabulary and syntax. This course is recommended for those intending to study at an Israeli university or who are engaged in a field in which a knowledge of modern Hebrew is necessary. Conducted in Hebrew.
Exclusion: May not be taken by students with Grade XIII Hebrew or the equivalent.
Prerequisite: NES 142 or permission of instructor

- NES 243 **Advanced Modern Hebrew** 2L, 1T:MWF12
 Survey of modern and contemporary Hebrew literature. Stylistic analysis of various literary genres. Conducted in Hebrew. Not open to native speakers.
Prerequisite: NES 242/245/Grade XIII Hebrew/permission of instructor
- NES 244 **Newspaper Hebrew** 3S:MWF2
 Intensive study of journalistic Hebrew. Of special interest for those concerned with contemporary Israel and the Middle East. Not open to native speakers.
Prerequisite: NES 142 or permission of instructor
- NES 245 **Studies in Modern Hebrew Literature** 3S:MWF10
 Readings in modern Hebrew literature at an intermediate level: short stories, poems. Conducted in Hebrew.
Exclusion: Native speakers
Prerequisite: NES 142 or permission of instructor
- NES 246 **Intermediate Biblical Hebrew (B)** 3S:MWF10
 For students with some knowledge of Hebrew but without formal study of biblical Hebrew grammar and syntax.
Exclusion: NES 141/241
- NES 251 **Introductory Hellenistic Greek** 3S:MWF2
 An introduction to Koine Greek. Selected readings from inter-Testamental writings, the New Testament, and the Apostolic Fathers.
Prerequisite: Grade XIII GRK/GRK 100
- NES 261 **The Prophets** 2L:TR12
 The rise of Hebrew prophecy and the history of Israel's protest movement with special attention to the major prophets of the 8th to 6th centuries B.C. No knowledge of Hebrew required.
- NES 262 **Classics of the Jewish Tradition (in Translation)** 2L, 1T:MWF10
 A discussion course based on reading of major works of classical and mediaeval Judaism in translation.
- NES 271 **Ancient Egypt** (Not offered 1973-74) 1L, 1T
 The political and cultural history of Egypt from the close of the predynastic period to the conquest of Alexander the Great. Attention will be given to the archaeological and literary evidence. (NES 271 and 272 will be offered in alternate years.)
Exclusion: NES 100 may not be taken during the same year.
- NES 272 **Ancient South-Western Asia** 1L, 1T:TR4
 The political and cultural history of the peoples of ancient south-western Asia, such as the Sumerians, Babylonians, Assyrians, Hittites, and Persians. (NES 272 and 271 will be offered in alternate years.)
Exclusion: NES 100 may not be taken in the same year.
- NES 280 **Archaeology of Palestine in the Biblical Period** 1L, 1T:TR10
 A study of the archaeology of Palestine with special attention to the biblical period.
- NES 281F **Prehistory of the Near East** 1L, 1T:TR2
 A survey of prehistoric man and his works, concentrating on Mesopotamia, Anatolia, Iran, Syria-Palestine, and Egypt to the end of the Early Bronze Age. Emphasis will be on the Neolithic and Urban Revolutions as social and economic developments which led to the rise of literate civilization in the Near East.

- NES 282S **The Art and Architecture of the Ancient Near East** 1L, 1T:TR2
Concentrates on the fine arts and monumental architecture of the historical periods in Mesopotamia and Egypt.
- NES 341 **Advanced Biblical Hebrew**
- NES 343F **Mediaeval Biblical Commentaries**
- NES 344S **Contemporary Hebrew Poetry**
- NES 346F **Mediaeval Hebrew Texts**
- NES 347S **Contemporary Hebrew Prose**
- NES 351 **Hellenistic Greek**
- NES 362 **Intertestamental Religious Literature**
- NES 364 **Religions of the Ancient Near East**
- NES 371 **History and Culture of Ancient Israel**

(These courses are described in the section which follows)

COURSE OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- NES 311 **Intermediate Akkadian** 3S:MWF10
Prerequisite: NES 211
- NES 321 **Intermediate Aramaic** 3S:MWF9
Prerequisite: NES 221
- NES 331 **Intermediate Egyptian** 3S:MWF9
Middle Egyptian Texts
Prerequisite: NES 231
- NES 341 **Advanced Biblical Hebrew** 3S:MWF2
An introduction to literary types. The texts to be read will mainly be from the prophetic literature.
Prerequisite: NES 241/246 or permission of instructor
- NES 343F **Mediaeval Biblical Commentaries** 3S:MWF1
Readings in biblical commentaries. History of mediaeval Jewish biblical exegesis.
Prerequisite: NES 243 or permission of instructor
- NES 344S **Contemporary Hebrew Poetry** 3S:MWF1
Prerequisite: NES 243 or permission of instructor
- NES 346F **Mediaeval Hebrew Texts** (Not offered 1973-74) 2S
Topic for 1972-73: The Binding of Isaac in post-biblical literature.
Prerequisite: NES 243 or permission of instructor
- NES 347S **Contemporary Hebrew Prose** (Not offered 1973-74) 2S
Topic for 1972-73: S. Y. Agnon.
Prerequisite: NES 243 or permission of instructor
- NES 351 **Hellenistic Greek** (Not offered 1973-74) 3S
Historical works.
Prerequisite: 2 courses in Greek

- NES 362 **Intertestamental Religious Literature** (Not offered 1973-74) 2S
A study of the literature produced by the Jewish community between the middle of the second century B.C. and the emergence of Christianity. Selections from the Apocrypha, the Pseudepigrapha, and the Dead Sea Scrolls will be read in translation.
Exclusion: NES 461
- NES 364 **Religions of the Ancient Near East** 2L:TR1
Religious belief and practice in Mesopotamia, Egypt and Canaan (Ugarit).
Prerequisite: NES 100/101
- NES 371 **History and Culture of Ancient Israel** 2L:TR11
The political and cultural history of Ancient Israel from the origin of the Hebrews to the exile and restoration in the Persian period.
Exclusion: NES 361. NES 100 may not be taken in the same year.

NES 451 **Hellenistic Greek**

(This course is described in the section which follows.)

COURSES OPEN TO FOURTH-YEAR STUDENTS

- NES 411 **Advanced Akkadian** 3S:MWF12
Prerequisite: NES 311
- NES 421 **Syriac Texts** 3S:M3-6
Prerequisite: NES 221/321
- NES 431 **Advanced Egyptian** 3S:MWF12
Late Egyptian texts.
Prerequisite: NES 331
- NES 441 **The Psalms** 2S:F3-5
Prerequisite: NES 341/342
- NES 442 **The Book of Ezekiel** (Not offered 1973-74) 2S
Prerequisite: NES 341/342
- NES 444 **Seminar in Mediaeval and Modern Hebrew Literature** 2S:T3-5
- NES 445 **Early Post-Biblical Hebrew** 2S:N
Readings in the Mishna, Midrash and Dead Sea Scrolls. (Victoria College)
Prerequisite: NES 241/242
- NES 451 **Hellenistic Greek** 3S:MWF3
Historical novels and poetic literature
Prerequisite: 2 courses in Greek
- NES 471 **History of the Hellenistic Near East** 1L, 1T:N
The political and cultural history of the Near East commencing with Achaemenid Persia. The chief emphasis of the course will be on the Hellenistic civilization.
- NES 481 **Problems in the Archaeology of the Ancient Near East** 2S:R3-5
Exclusion: NES 100/281F/282S may not be taken in the same year.

NUMERICAL ANALYSIS - See CSC under "Computer Science"

PALI - See SIS under "Sanskrit and Indian Studies"

PCL**PHARMACOLOGY**

Given by the staff of the Faculty of Medicine

<i>Chairman of Department:</i>	Professor W. Kalow
<i>Co-ordinator of Undergraduate Studies:</i>	Professor W.H.E. Roschlau
<i>Enquiries:</i>	Medical Sciences Building, Room 4245 (928-3102 or 928-2723)

Pharmacology is a broadly based discipline of biology dealing with the interaction of chemical compounds and living systems. Pharmacology is specifically concerned with the study of chemicals as therapeutic agents (drugs), as toxic materials (pollutants and poisons), and as social factors, drawing extensively on many physical, biological and behavioural sciences such as organic chemistry, biochemistry, physiology and various clinical specialties. Pharmacology thus contributes in many ways to the understanding of life processes which is valuable to biological sciences in general and to medicine in particular. The courses offered by the Department of Pharmacology, Faculty of Medicine, are designed primarily for the advanced biology student whose interests require exposure to this complex and extensive subject. Students interested in environmental problems should also refer to courses listed in the Interdisciplinary Studies section of this calendar. (INX 220, 320, 420).

COURSES OPEN TO FOURTH-YEAR STUDENTS

- PCL 470 General Pharmacology** 2L, 1T:MWF12
 An introduction to the broad field of drug study consisting of a series of lectures and required reading on the nature of drugs and chemicals and the biological mechanisms of their interaction with living systems and their constituent parts.
Prerequisite: ANA 200/ZOO (250 & 251), BCH 320/321, BIO 100/111/120, CHM 240/241, MAT 110/130/135/139/150, PHY 110/130, PSL 321/322
- PCL 471 Selected Topics in Pharmacology** 3P:R2-5, 2T:N
 A companion course to PHM 470 consisting of demonstrations, seminars and laboratory exercises. The course is designed for the student in biological science interested in promotion, through personal exploration, of his understanding of biological functions and their manipulation with chemical agents. (Limited number.)
Prerequisite: PSL 373Y, permission of the Department
Co-requisite: PCL 470 (PSL 430 recommended.)
- PCL 472 Projects in Pharmacology** N
 Research project with reading assignments by special arrangement with professors in the Department of Pharmacology.
Prerequisite: Consent of the Department
- PCL 473 Graduate Course in Pharmacology** N
 Selected undergraduate students may participate in a graduate course in Pharmacology listed in the Calendar of the School of Graduate Studies.
Prerequisite: Consent of the Department

PERSIAN - See ISL under "Islamic Studies"

PHE**PHYSICAL AND HEALTH EDUCATION**

Given by members of the School of Physical and Health Education

<i>Director:</i>	Professor J.V. Daniel
<i>Counsellor:</i>	Professor R.E. Stone
<i>Enquiries:</i>	121 St. Joseph Street (928-3449)

Studies in human movement phenomena centre on the individual as mover—particularly as he/she engages in those acts termed sport, dance, exercise, spontaneous play. Some students pursue these

studies in order to lay the groundwork for the teaching of physical education or for coaching, or for working with groups or individuals in leisure settings. Others undertake them out of the same interest that students have in the human phenomena of music, art, literature, architecture and the like, and there are others who wish to understand themselves better as moving, striving persons. (Of course there are those prompted by all of these reasons.)

The course offered by the School of Physical and Health Education to the Faculty of Arts and Science is particularly suited for students in the second and third groups. It requires no technical background in physical education. It may be noted that students considering a career in secondary school teaching and for whom physical education might constitute a second area of interest may offer this course as part of the five required of those seeking High School Assistant Specialist Certificate in Physical Education.

PHE 305F The Act of Moving

1L, 1T:TR10

This course focuses on theories and ideas pertaining to human movement. The substance of selected theories (Bode, Delsarte, Jaques-Dalcroze, Kephart, Laban, Metheny, Piaget, Rugg) is presented for discussion in terms of their assumptions, lines of evidence, and historical and contemporary significance. Among the themes emphasized are movement and cognition, movement as metaphor; personal predilections in moving, the "right use," and "ideal" patterns of moving. *R.E. Stone.*

PHI

PHILOSOPHY (ST. MICHAEL'S COLLEGE)

<i>Chairman:</i>	Professor L.E.M. Lynch
<i>Undergraduate Counsellors:</i>	Professor L.E.M. Lynch (Ext. 215) Professor B.F. Brown (Ext. 236) Professor E.E. Tully (Ext. 223)
<i>Enquiries:</i>	Teefy Hall, St. Michael's College, Room A 6 or 8 (921-3151)

Throughout its eminent tradition philosophy has been a subject of higher learning, a common feature of university study. It has always been associated with other university subjects, sometimes quite closely, and indeed some of the sciences which are now fully developed and independent of her were once the wards of philosophy. The separation has been advantageous, for the philosopher recognizes that his proper study is not anything identifiable with the objectives of another university discipline. Though in some of its specialized parts philosophy will make use of the data of other disciplines—of physics and psychology, for instance—it is by its nature incapable of assimilation to another discipline. Philosophy preserves a freedom and a perspective in its enquiry to raise questions which are both critical and comprehensive and which are not systematically examined elsewhere. Instead of merely assuming the standards by which we commonly enumerate facts and generalize from them, it examines those very standards; instead of accepting that the actions of individuals and governments can be clearly described as good or bad, it searches for the meaning of our moral judgments; instead of taking the claims of science and of religion for granted, it asks what bearing scientific truths might have on our conception of what is real and explores the grounds of religious knowledge and belief. In carrying out his work the philosopher examines the language we use to describe and evaluate the world as well as the nature of language itself to describe and evaluate. At the same time he maintains a lively sense of what the great philosophers of the past have said about the problems which concern him.

For the university student the opportunity of doing philosophy is both refreshing and challenging. The correlative goals of precision and generality can become a useful counterpoint to courses taken in other disciplines, while the ideal of critical and objective reflection which philosophers encourage is one of the ideals of university life itself. The benefits of doing philosophy can be discovered through taking even a few courses while at university, though obviously they will be more fully realized by proceeding to a stage that includes some advanced work. Nevertheless, perfection in reasoning should not be expected. None are aware more than philosophers how easy it is to fall short of the ideal, and

the philosopher who becomes a mere apologist for his viewpoint has forsaken philosophy for dogmatism. But philosophy is alive where there is critical thinking going on, and the student may often find that discovering mistakes made and dead ends taken in the course of an enquiry can be as instructive and rewarding as bringing that enquiry successfully to an end.

Since well before its federation with the University of Toronto, St. Michael's College has had its own Department of Philosophy. The St. Michael's Department represents one of the ways in which the collegiate system benefits not only those students registered at the College but all students throughout the University. The Department operates as a cohesive unit in the much larger university, ensuring students of thorough supervision both inside and outside class, the indispensable convenience of small lecture and discussion groups at all levels, and the opportunity for association with a college that has a well-established tradition of intellectual excellence at the University of Toronto. The Philosophy Department at St. Michael's offers a complete range of courses staffed by philosophers representing a balanced and fruitful diversity in their approaches to the subject. All courses, including the programme of concentration in philosophy, are open to all students at the University of Toronto.

The introductory course, PHI 150, is regularly offered in six independent sections, each taught by an experienced senior philosopher from the Department, each dealing with a different set of problems taken from different areas of philosophy such as Philosophy of the Social Sciences, Philosophy of Man, Logic and Theory of Knowledge, and the History of Philosophy. The 200-series courses range over the history of philosophy, problematical areas (e.g. PHI 252F Theory of Knowledge), key divisional areas (e.g. PHI 270 Social and Political Philosophy), and areas of important topical interest (e.g. PHI 276F Morality, Medicine and the Law). These courses are designed both for those students who wish to add to their knowledge of philosophy without proceeding to an advanced level as well as for those who do wish to satisfy the prerequisites for 300-level (and 400-level) work. Courses at the 300-level correspond in most instances to the 200-series offering, exploring to a greater depth the issues and problems which these uncover. A number of the 300-series courses will particularly interest students specialising in other disciplines; these are the problems-oriented seminars in areas such as political philosophy, aesthetics, philosophy of science and philosophy of religion, which will afford an opportunity for advanced research and discussion in small-group seminars. The majority of remaining advanced courses are also open to students not concentrating in philosophy. Two courses, however, are specifically intended for those who are concentrating. These are Departmental Seminar I and II (PHI 350 and PHI 450) which are jointly taught by several members of the St. Michael's Department, each representing a different method and background in philosophy. In a collaborative effort, staff and students concentrate on different aspects of philosophical problems as well as on different points of philosophical methodology. The nature of the course is intended by the Department to be a prime example of learning philosophy at first hand by doing it in a way not completely possible in other philosophy courses.

The student who wishes to concentrate in philosophy at St. Michael's may be a Named Programmer or a Departmental Specialist. A Named Programmer must take six Philosophy courses from above the 100-level, at least three of these being PHI courses from the 300-level (including the required PHI 350). A Departmental Specialist must take nine courses from the 100-level and above, at least six being from the 300-level (including the required PHI 350 and 450). The programme of concentration at St. Michael's is not regarded by the Department as essentially or exclusively preparation for graduate school work in philosophy (though it satisfies that goal well). Its principal aim is to produce good undergraduate philosophers who are sensitive to the variety, complexity and richness of philosophy. The programme of concentration and especially its Departmental Seminars provide a valuable framework in which the student can pursue qualitative excellence as well as make an informed judgment about whether to continue in philosophy.

The St. Michael's Departments of Philosophy and of Religious Studies cooperate in an Inter-Departmental Specialist programme, one of whose distinctive features are the two related Inter-Departmental Seminars (INM 380, INM 480). For a description of these courses, cf. the listing under the heading "INM (St. Michael's)", and for details of the programme's requirements, consult the entry for "Religious Studies" under Suggested Programmes of Study.

Each of the following course descriptions indicates the range of topics and/or figures which the Department considers appropriate for that particular course. For more detailed information as to the current instructor, content, readings, etc., consult the annually revised booklet, *SMC Philosophy*

Courses, available at the registrar's office or the office of Professor B.F. Brown, Teefy Hall, Room 6, St. Michael's College. The staff counsellors listed above welcome enquiries from current or prospective University of Toronto students regarding its courses, its programme of concentration, and the study of philosophy.

Please also note the following before turning to the list of courses:

1. St. Michael's College philosophy course numberings follow a particular pattern. The first digit (1, 2, 3, 4) indicates the level of a course in the Department's programme of offerings, while the second two digits represent the place of a course at that level: 00-49 represents an historical sequence, 50-99 a range of courses dealing with philosophical areas, divisions and problems.
2. Not all courses listed below will be offered in any one year. The Department expects to rotate the following courses in two-year cycles: PHI 300-PHI 313; PHI 320F-PHI 330S; PHI 343-PHI 345; PHI 358F-PHI 395F; PHI 360S-PHI 370F; PHI 365S-PHI 380F.
3. Regarding the list of prerequisites, only St. Michael's College courses have been mentioned. Appropriate substitutions may be made for these from among the University Department's own list of courses.

- PHI 150 Introduction to Philosophical Problems** 2L, 1T L1, T1: MWF10, L2, T2: MWF11,
L3, T3: MWF12, L4, T4: MWF2, L5, T5: TR10, F1, L6, T6: TR11, F1
Students in philosophical conversation with staff on such issues as: the nature of philosophy, its differences from and relation to other disciplines; man; life, consciousness and personality; knowledge and belief, experience, correct reasoning and explanation; human values: norms, freedom, responsibility, law and society; the ultimately real, existence, mind, God, immortality.
Exclusion: PHL 100, 101, 102
- PHI 200 Classical Philosophy** 2L: TR3, 1T: N
The history of ancient Greek philosophy, with emphasis on Plato and Aristotle. The course will also include a selection from the following schools of thought: Presocratics, Stoicism, Skepticism, Epicureanism, and Neoplatonism. The reading of primary sources on key problems will be stressed.
Exclusion: PHL 240F, 241S
- PHI 210 Mediaeval Philosophy** 2L: TR2
The philosophies of the principal figures of the Mediaeval era, including Augustine, Anselm, Avicenna, Maimonides, Bonaventure, Thomas Aquinas, Duns Scotus, William of Ockham, and others, on such problems as: the being and nature of God, creation, finite beings, man and the soul, universals, and knowledge.
Exclusion: PHL 242F
Recommended background: PHI 200 or a course in Greek philosophy
- PHI 220 Modern Philosophy to Kant** 2L: TR11
This course will include some of the following: Descartes, Hobbes, Spinoza, Locke, Leibniz, Berkeley, Hume and Kant, on such topics as: the existence of God, freedom of will, mind and body, the problem of evil, the limits of human knowledge, the reality of the external world, and causality.
Exclusion: PHL 243F, 244S
Recommended background: One prior or concurrent course in philosophy
- PHI 230F German Philosophy in the 19th Century** 2L, 1T: MWF2
A study of Hegel's attempt at a universal systematic philosophy and its subsequent critics, such as Feuerbach, Marx, and Nietzsche, with particular attention to the sources of various currents in 20th century European thought, such as existentialism.

- PHI 240S **Existentialism** 2L, 1T:MWF2
 A study of the more notable figures: Heidegger, Jaspers, Marcel, Sartre, Merleau-Ponty, Ricoeur, Camus.
Exclusion: PHL 230F
- PHI 243F **British Philosophy Since 1900** 3L:MWF12
 A survey of the principal figures and doctrines in British philosophy from the period of Moore and Russell to the present.
- PHI 245S **American Philosophy** 3L:MWF12
 The philosophies of the principal figures of the nineteenth and twentieth centuries, to include some of the following: Emerson, Royce, the Critical Realists, Santayana, the Pragmatists: Peirce, James, and Dewey.
- PHI 250S **Philosophical Inquiries** 2L:TR1
 Students will undertake a *philosophical* investigation of the work of an eminent thinker who is not himself a philosopher, but whose work in an area such as sociology, psychology, political theory, religion or history is regarded as philosophically significant, e.g. Freud, Skinner, Toynbee, Chomsky. The emphasis in the course will be on those concepts and themes that have some bearing on philosophy, and on the use of philosophical tools in critical reading and discussion.
Prerequisite: one other full course in philosophy
- PHI 252F **Knowing, Believing, and Objectivity** 2L:TR1
 This course concerns the presuppositions, activities, and criteria involved whenever one comes to say, "I know . . ." or "I believe . . ." Specific topics to be investigated include the techniques for achieving objectivity in common-sense, scientific, and philosophical fields; the communal dimensions of inquiry, meaning, and verification; and the invariant and developmental aspects of truth.
Exclusion: PHL 220F
- PHI 255S **Reality: Its Structure and Dynamics** 2L:TR1
 This course is devoted to the study of reality considered in its most basic aspect, its being or existence. Topics to be treated include the notion, grades, and ground of being; the kinds of beings, their origin, and their destiny; scientific and poetic language about being.
Exclusion: PHL 260F
- PHI 256 **Philosophy of Man** 2L:TR9
 The philosophical study of the nature of man and human activities. Different philosophical views will be considered on such topics as: perception, intellectual activity; freedom, conscience, the psychological conditions of moral action; self, body, and mind.
- PHI 260 **Ethics** 2S S1:M4-6, S2:T4-6
 Philosophical consideration of moral good and evil; what constitutes the morality of an act; the subjectivity or objectivity of moral laws; natural law; the individual or social origin of moral norms; moral law and religious or civil sanctions; the conceptions of 'conscience', 'virtue', 'vice'. Significant moralists from the history of philosophy will be consulted for their views.
Exclusion: PHL 200F/S, PHL 201F/S
- PHI 265 **Art and Beauty in a Philosophic Context** 2L:MW1
 Using an historical approach, an examination of the definitions of art and the aesthetic experience are the basis for further investigations as to classification of the arts, role of the critic, creativity, social functions of the arts.
Exclusion: PHL 202F/S/PHL 206F
Prerequisite: One course in Philosophy

- PHI 270 **Social and Political Philosophy** 2S S1:W4-6, S2:R4-6
 This course is partly historical and partly problematic in orientation. Initially, students will be acquainted with philosophical views that have helped form contemporary political convictions, by the reading of outstanding political thinkers. After this preparation follows discussion of selected problems; e.g.: human personality as social and historical, natural and positive law, authority, freedom and conscience, the use of force, war.
Exclusion: PHL 210F/S, PHL 211F/S
- PHI 275F **Philosophy, Law and Society** 3L:MWF12
 Is the law on your side or against you? Are legal institutions obstacles or aids to social growth? Answers to these and similar questions will be sought by exploring a central theme: Law as a humanizing and civilizing force in society. It will be examined from several perspectives: legal institutions and practice, social structures and political experience, philosophic theory and moral ideals.
- PHI 276F **Morality, Medicine and the Law** 2L:MW1, 1T:N
 A philosophical examination of some of the moral implications of recent developments in medical science, together with a consideration of related legal and social issues. Such topics as the following will be treated: the definition of death, abortion, euthanasia, genetic manipulation, scientific experimentation on humans, organ transplantation.
- PHI 278S **Philosophy of Education** 2L:MW1, 1T:N
 A critical study of problems drawn from some of the following areas: the meaning of education; the aims of education; the agents of education; norms and methods of teaching; the subject-matter of education; "liberal education"; morality and education; the social contexts of education; authority and freedom in the school; the nature of philosophy of education and its relation to other disciplines.
Exclusion: PHL 214S
- PHI 280 **Philosophy of Religion** 2L:TR10
 A critical study of philosophical arguments for and against religious belief, including such topics as: the existence and nature of God; the possibility of knowledge about God; revelation, faith, superstition; myth, metaphor and analogy; the consequences of religious belief for morality; religion and science.
Exclusion: PHL 261F
- PHI 282S **Contemporary Problems in Christian Thought** 3L:MWF12
 The selection of topics for philosophical examination will vary from year to year. Please consult the Department Bulletin for details of next year's course.
- PHI 290F **Practical Logic** 2L:TR12
 The course will concentrate on the elements of contemporary symbolic logic and the usefulness of its application to arguments in ordinary language. Time will also be given to the classification of arguments and to the assessment of fallacious reasoning.
Exclusion: PHL 250F/S
- PHI 295S **Philosophy of Science** 2L:TR12
 A philosophical discussion of such fundamental concepts as induction, causality, explanation, space and time, and the theory of relativity. Readings will be drawn from the works of both philosophers and scientists. A background in science is not essential for the course.
Exclusion: PHL 272S
- PHI 300 **Seminar on Greek Philosophy** 2L:T4-6
 A critical examination of some theories developed by major Greek philosophers (especially Plato, Aristotle, Plotinus), and of their relationship to post-Hellenic thought.
Exclusion: PHL 340F, 341S
Prerequisite: PHI 200

- PHI 313 **The Philosophy of Aquinas** (Not offered 1973-74) 2L
 This course prepares students for more serious study of Aquinas' thought by introducing Aquinas in his historical setting, acquainting students with accepted tools for interpreting his writings, actually engaging in the task of following his texts as they unfold his thought on one or two selected problems, and examining the efforts of three or four different modern commentators who use his thought to explore those problems in a contemporary context.
Prerequisite: PHI 210
- PHI 320F **Seminar on 17th and 18th Century Philosophy** (Not offered 1973-74) 2S
 A detailed study of one or more philosophers not emphasized in other courses dealing with the period (especially PHI 220 and 323F), e.g., Spinoza, Leibniz, Reid, or of an important theme in the period, e.g., the concept of substance, the hierarchy of perfection.
Exclusion: PHL 342F, 343S
Prerequisite: One of PHI 200, 210, 220
- PHI 323F **Kant** 2S:W4-6
 This course will concentrate on the reading and discussion in seminar of: 1) Kant's *Inaugural Dissertation*, 2) Selections from Kant's *Critique of Pure Reason* (stressing the antinomies and paralogisms), and 3) Kant's *Fundamental Principles of the Metaphysic of Morals*.
Exclusion: PHL 344F
Prerequisite: PHI 220
- PHI 330S **Seminar on 19th Century Philosophy** (Not offered 1973-74) 2S
 The preoccupations of philosophy in this period will be studied in depth by concentrating on a single author or a single theme in a few authors.
Exclusion: PHL 346F
Prerequisite: PHI 220 and one of PHI 230F, 240S, 243F
- PHI 333S **Hegel** 2S:W4-6
 This course will concentrate on the reading and discussion in seminar of: 1) Introduction to Hegel's *Lectures on the History of Philosophy*, 2) Selections from Hegel's *Science of Logic* (stressing the treatment of Being and Essence), 3) Selections from Hegel's *Phenomenology of Spirit* (especially the Preface and Introduction).
Exclusion: PHL 345S
Prerequisite: PHI 323S
- PHI 340 **Seminar on Phenomenology and Existentialism** 2S:TR1
 A study of these major figures: Husserl, Heidegger, Marcel, Sartre, Jaspers, Merleau-Ponty and Ricoeur, on such topics as the Ego, being-in-the-world, Being, consciousness, phenomenological reduction, intentional analysis, constitution, intrasubjectivity, intersubjectivity, time, historicity, incarnation, facticity, body, perception, and freedom.
Exclusion: PHL 330S
Prerequisite: PHI 220
- PHI 343 **British Analysis: Method & Meaning** 2S:T4-6
 The approaches of different analytical philosophers to topics like: knowledge of perceptual objects, knowledge of other minds, the reconstruction of language, philosophical defences of ordinary language, and the concept of a person. The philosophers for this study include; Moore, Russell, Wittgenstein, Ayer, Ryle, Austin, and Strawson. Each year a selection of these will be concentrated on.
Exclusion: PHL 348S
Prerequisite: PHI 220

- PHI 345 **Seminar on American Philosophy** (Not offered 1973-74) 2S
 A selective and detailed treatment of individual philosophers of philosophical themes from the beginnings of pragmatism to the present.
Prerequisite: PHI 220
- PHI 350 **Seminar I** 2S:N
 The course will be jointly taught by several staff members who will exemplify in their work and discussion different philosophical points of view. Students and staff will concentrate on both philosophical problems and related problems of philosophical methodology. The format of the course is intended to enable students to be collaborators in a continuing philosophical discussion, so that they might learn philosophy at first hand by doing it. The course is open only to concentrators in philosophy and is required of them.
- PHI 352 **Seminar in Epistemology** 2S:M4-6
 This course is a detailed descriptive and critical investigation of some aspect of human knowing in general. The investigation involves both careful reflection upon one's own knowing and, as well, the study of selections from several different periods in the history of philosophy. In the latter regard, however, the controlling viewpoint is systematic rather than historical as such.
Exclusion: PHL 320S
Prerequisite: One PHI 200, 210, 220, or equivalent, plus one other full course in philosophy
- PHI 355 **Seminar on Metaphysics** 2S:TR2
 A philosophical study of reality, considered in its most basic aspect: its being or existence. Works of outstanding metaphysicians will ground discussion on such topics as the nature, possibility, and language of metaphysics; being and beings; essence and existence; substance, causality, space and time; the supersensible, God, the Absolute, spirit, immortality.
Exclusion: PHL 360S
Prerequisite: One of PHI 200, 210, 220, plus one other full course
- PHI 358F **Philosophy of Mind** 2S:W9-11
 An introduction to some basic problems in an area of philosophy which has attracted much attention in recent years: privacy, other minds, behaviourism, the intentionality of thought, the existence of sensations, human action and volition.
Prerequisites: Two full courses from PHI 200–295S
- PHI 360S **Problems in Ethics** (Not offered 1973-74) 2L
 A relatively fundamental and specialized question about moral reasoning will be discussed, such as Ethical Naturalism; or a classic school of ethical thought, such as Aristotle's ethics.
Exclusion: PHL 300S
Prerequisite: PHI 260 or, with permission of instructor, PHI 276F
- PHI 365S **Philosophical Problems: Beauty and the Arts** 2L:F9-11
 Themes selected by individual students will be investigated through directed group-readings and discussion. Individual themes will be expanded into extensive essays through co-operative class-discussion, personal consultation, and private work with the instructor.
Exclusions: PHL 202F/S, PHL 206F/PHI 265
Prerequisites: 202 F/S PHL 206F/PHI 265
- PHI 370F **Problems in Political Philosophy** 2L:M9-11
 A particular political concept such as equality or authority will be analyzed in depth or the philosophical sources of a single current political ideology traced back historically.
Prerequisite: PHI 270 or, with permission of instructor, PHI 276F

- PHI 380F **Problems in the Philosophy of Religion** (Not offered 1973-74) 2L
 Critical study of selected problems concerning religious belief and behaviour.
Exclusion: PHL 361S
Prerequisite: PHI 280 or, with permission of instructor, PHI 282S
- PHI 390F **Formal Logic** 2L:R4-6
 An intermediate course on the elements of the propositional calculus and the predicate calculus, their axiomatization, and metalogical proofs of their logical adequacy.
Prerequisite: PHI 290F
- PHI 392S **Logical Theory** 2L:R4-6
 A study of 20th century analytical debates on such issues as truth, meaning and reference, predication, the distinctions between analytic and synthetic propositions and between particular and general propositions, definitions, and undecidability in formal systems. The selection of topics and emphasis will change from year to year.
Exclusion: PHL 351F
Prerequisite: PHI 390F
- PHI 395F **Problems in the Philosophy of Science** (Not offered 1973-74) 2L
 A detailed study either of a single problem (such as causality, counterfactual statements, or explanation), or of a cluster of problems (such as induction and confirmation or space, time and relativity). The selection of topics will vary from year to year and will be chosen in agreement with the enrolled students. A background in science will be useful though not essential.
Exclusion: PHL 370F
Prerequisite: PHI 295S
- PHI 450 **Departmental Seminar II** 2S:N
 In theme and content this course will complement PHI 350 and be given by the same staff who will have given that course during the previous year. Its aim is to provide students with an opportunity for independent study, though without sacrificing the advantages of seminar learning. This course is open to students who have satisfied prerequisites.
Prerequisite: PHI 350
- PHI 451 **Research Tutorial** N
 Directed work on an individually selected topic, leading to a major research paper. Enrolment in this course is subject to the approval of the Department.

PHL**PHILOSOPHY***University Department*

<i>Chairman:</i>	Professor J.G. Slater
<i>Undergraduate Secretary:</i>	Professor R.B. de Sousa
<i>Enquiries:</i>	215 Huron Street, Ninth Floor (928-3311)

College Departments

<i>Victoria College Chairman:</i>	Professor J.A. Graff
<i>Trinity College Chairman:</i>	Professor G. Edison

The Greek words from which "philosophy" is formed mean "love of wisdom" and all great philosophers have been moved by an intense devotion to the search for wisdom. What distinguishes philosophy from the physical and social sciences is its concern not only with the truths which are discovered by means of specialized methods of investigation, but with the implications such discoveries have for individual human beings in their relations with one another and in their understanding and appreciation of the world in which they find themselves. However, it has, in common with the

sciences, an abiding interest in those basic assumptions about the nature of the physical and social world which underlie even the methodology by means of which scientists seek to explain their observations. It is from the challenge both to know and to accommodate such discoveries that the most searching and revealing philosophical questions arise.

Whatever his personal background or social position, each man has a set of beliefs about the areas of life which most concern him. But a philosopher is not content to accept, uncriticized and unanalyzed, either the conventional judgements of common sense or the current bases of science and scientific method. The philosopher calls into question even the most cherished of these beliefs, attempting to show that they are either well- or ill-founded, knowledge or false opinion. But the value of the endeavour lies in the questioning itself and not in the admittedly impossible task of coming to a complete understanding of the foundations of our knowledge.

Despite its intrinsic merits and its value as a means of developing critical awareness, there is no obvious practical application to which the student of Philosophy can direct his studies. The discipline is taught exclusively at institutions of higher learning, though it is hoped that it will, in the near future, be possible for graduates of a programme specializing in Philosophy to qualify for entry to a Type A certificate programme at the Faculty of Education. There will, of course, be some students who will want to pursue graduate work in Philosophy, and to become professional philosophers, and many who will want to do further work in fields such as Law or Criminology where some knowledge of Philosophy is a distinct advantage. Many students whose primary interests lie in other areas, such as Classics, Fine Art, Music, Literature, Physical and Social Sciences, and Mathematics, will want to do some work in Philosophy, at least in those areas related to their own fields; e.g., Greek Philosophy, Aesthetics, the Philosophy of Music or of Literature, and the Philosophy of Science or of Mathematics.

A glance through the courses offered in Philosophy will inform any prospective student of the names of some of the philosophers studied, and the special areas investigated in the Philosophy Programmes at the University of Toronto. A dictionary or encyclopedia will supply standard definitions of logic, ethics, epistemology and metaphysics. But whoever wants to know what Philosophy is must do it. A student can learn a great deal from a study of what has been written and thought by such philosophers as Plato and Aristotle, Augustine and Aquinas, Locke and Hume, Descartes and Spinoza, Kant and Hegel, Mill, Russell, Wittgenstein, Husserl, Sartre and Heidegger. But such study is, nevertheless, only an important preliminary. To read without bold and critical thinking is next to useless.

The Specialist Programme in Philosophy requires the successful completion of eighteen half-courses in philosophy (100 level courses count as two half-courses), at least half of which must be drawn from above the 200 level. Students are urged to balance their programme with courses in other disciplines. Students who are planning to go on to graduate study in philosophy are strongly advised to include within their programmes some work in each of the following areas: epistemology, metaphysics, logic, ethics or political philosophy, ancient philosophy, early modern philosophy (17th and 18th centuries), recent philosophy (19th and 20th centuries). A list of courses in each of these areas may be found in the departmental *Handbook*. Such students should also include at least two Special Tutorials in their programmes. The 100 level introductory courses are intended to serve as an indication of the range of topics and methods of approach covered in the discipline. They are not a prerequisite for any further courses. However, students who think they might wish to do advanced work in philosophy are strongly advised to take logic at the 200 level (PHL 250F/S).

In addition to its Specialist Programme, the Philosophy Department has developed, in cooperation with other departments in the Faculty, a number of Joint Programmes, each of which combines study in philosophy and one other discipline. A full list of Joint Programmes developed to date may be found in the Calendar under Suggested Programmes of Study.

The University of Toronto Philosophy Department (on the St. George Campus) consists of the University Department (which includes the Ethics Department of University College) and the College Departments at Victoria College and Trinity College. A unified curriculum is offered and students in this Faculty are free to take Philosophy courses wherever they please. However, where timetable permits and where the desired course is offered, students are encouraged to take their Philosophy courses from their "home" Department. Thus Victoria College and Trinity College students should wherever possible enrol in course sections offered by their College Departments. Students from other Colleges should wherever possible enrol in course sections offered by the University Department.

The Department maintains an extensive counselling service, and students who wish advice concerning a philosophy programme or any course in philosophy are urged to take advantage of it. Counselling is available in the University Department (215 Huron St., ninth floor) and in the College Departments. In addition, the Department publishes an annual *Handbook* which contains full and up to date information on programmes and courses, including names of instructors and descriptions of particular course sections. The *Handbook* is published in the spring (for the succeeding year) and is available from the University Department, the College Departments, and offices of College Registrars.

COURSE LISTINGS

All PHL courses are open to students in any year provided they meet the stated prerequisites (if any). Not all courses listed in the Calendar will be offered in a given year. For further information concerning course sections, their contents and their instructors, students should consult the Department *Handbook*, which is available from the University Department (215 Huron Street, ninth floor) and from the College Departments at Victoria College and Trinity College.

The Department offers three basic introductory courses. A student may take no more than one 100-level course for credit.

- PHL 100 Logic, Knowledge, and Reality** 2L, 1T L1:TR11, L2:TR12, T:N
An introduction to the areas of philosophy including logic, theory of knowledge, and metaphysics. In that part of the course devoted to logic we will examine elementary techniques of modern symbolic logic and problems in inductive logic and probability. In the remainder of the course we will consider such questions as: What can be known with certainty? What is truth? Could time run backwards? What is real?
Exclusion: PHL 101, PHL 102, PHI 150
- PHL 101 Value and Man** 2L, 1T L1:MW1, VL2:TR2, L3:T7.30-9.30p.m., T:N
An introduction to the areas of philosophy including ethics or political philosophy, philosophy of religion, and metaphysics. We will consider such questions as: Why should one be moral? What reason is there for citizens to obey the law? What arguments are there for the existence of God? What is the relation between minds and bodies?
Exclusion: PHL 100, PHL 102, PHI 150
- PHL 102 Philosophical Classics** 2L, 1T TL1:TR10, L2:TR1, T:N
A historical introduction to philosophy, including philosophers such as Plato, Aristotle, Aquinas, Descartes, Berkeley, Hume, Mill, Nietzsche, and Russell.
Exclusion: PHL 100, PHL 101, PHI 150

NOTE: No course offered by the Department at the 200-level carries any prerequisites.

- PHL 200F Reason and Morality** 3L TL1:MWF12
An examination of the nature and rationality of the moral point of view in human interaction. Arguments for hedonism, moral relativism and egoism will be examined.
Exclusion: PHI 260
- PHL 200S Reason and Morality** 3L VL1:MWF10, L2:MWF2
The same as PHL 200F
- PHL 201F Ethical Theories** 3L VL1:MWF10
A survey and comparison of the ethical theories of philosophers such as Plato, Aristotle, Hume, Kant, Mill, Moore and Hare.
Exclusion: PHI 260
- PHL 201S Ethical Theories** 3L TL1:MWF12
The same as PHL 201F

- PHL 202F **Aesthetics** 3L L1:MWF2, VL2:TR11, F1
Some central areas in philosophy of art: the nature of a work of art, modern and traditional definitions and theories of art, aesthetic experience, perception and sensibility, objectivity and non-relativity in criticism, possibility of standards of taste or evaluation.
Exclusion: PHI 265
- PHL 202S **Aesthetics** 3L TL1:MWF11, L2:MWF3
The same as PHL 202F
- PHL 203S **Philosophy of Music** 3L:TR11, F1
Types of aesthetic theory with special emphasis on problems in the philosophy of music.
- PHL 204F **Literature and Philosophy** 3L VL1:MWF10
Literature provides a dramatic setting for presenting philosophical ideas. We will discuss the interplay between literature and philosophy.
- PHL 204S **Literature and Philosophy** 3L L1:MWF2, L2:TRF1, L3:M7.30-9.30p.m.
The same as PHL 204F
- PHL 205F **Contemporary Social Issues** 3L L1:MWF10, VL2:MWF12, TL3:MWF3
A study of principles and arguments in such contemporary problems as sexual morality, urban problems, Canadian nationalism, capital punishment, women's liberation, pollution, civil disobedience, conscientious objection, and revolution.
- PHL 205S **Contemporary Social Issues** 3L L1:MWF11, L2:MWF2, VL3:TRF1, L4:R7.30-9.30p.m.
The same as PHL 205F.
- PHL 206S **Selected Texts in the History of Aesthetics** 3L:MWF2
Exclusion: PHI 265
- PHL 207S **Film Aesthetics** (Not offered, 1973-74) 3L
A selection of films from a variety of film types is shown and against this background there is a discussion of various questions concerning the aesthetics of film, such as: principles of film criticism; film space; form and content; the function of editing; acting; potentialities and limitations of the medium; "reality" in *cinema verité*.
- PHL 210F **The State and the Citizen** 3L TL1:MWF11, L2:W7.30-9.30p.m.
An introduction to topics in political philosophy: the nature of the state, its justification, its proper limits and the obligations of a citizen.
- PHL 210S **The State and the Citizen** 3L VL:MWF9
The same as PHL 210F
- PHL 211F **Political Theories** 3L:MWF9
A critical examination of such prominent political philosophers as Plato, Aristotle, Hobbes, Locke, Rousseau, Mill and Marx. Some of the themes around which this examination will be built: democracy and totalitarianism, liberty and authority, the connection between political and economic systems.
Exclusion: PHI 270
- PHL 211S **Political Theories** 3L L1:MWF11, L2:W7.30-9.30p.m.
The same as PHL 211F.
- PHL 212F **Marx and Marxism** 3L:MWF2
An examination of the ontological, epistemological, ethical, historical-social, and revolutionary political theories of Marx and his followers, covering such topics as: materialism, dialectics, praxis, absolute and relative truth, Marxist morality, economic theory, and historical causation.

- PHL 212S **Marx and Marxism** 3L:MWF3
The same as PHL 212F.
- PHL 213F **The University and Canadian Society** (Not offered 1973-74) 3L
A philosophical examination of the goals and the function of a university in Canadian society. What is the social function and justification of granting degrees, conducting examinations or making academic evaluations? What does society demand of a university and what should it demand? Can and should a university remain politically insulated? These questions will be dealt with in the light of a critical examination of current work in the philosophy of education.
- PHL 214S **Educational Theories** 3L L1:MWF10, TL2:MWF3
What are the proper goals of an educational system? How are they related to the kinds of social institutions and individual personalities we value? Topics discussed will be drawn from the following: problems of learning theory, the knowledge industry, compulsory education, indoctrination and regimentation, moral, political and doctrinal neutrality of educational systems.
Exclusion: PHI 278S
- PHL 215F **Philosophy and the Human Sciences** 3L:TR2, F1
Social theorists such as Behaviourists, Functionalists, Marxists, Symbolic Interactionists, and Freudians debate rival approaches to the study of man and society, and at the most general level these debates often involve philosophical questions: free will and determinism, values and objectivity, the nature of the self, the nature of social causation, indeed the possibility and moral desirability of having scientific social theories at all. In this course such questions as these will be discussed in the light of their import for the social sciences today.
- PHL 216F **Deviance and Abnormality** 3L L1:MWF12, L2:MWF2
The notions of "deviance" and "abnormality" in the social sciences raise questions in theory of knowledge and ethics. According to what criteria do we decide that an action is "unnatural", a man is "insane" or "abnormal", a life-style is "deviant" or a political view is "irrational"? Is the application of these labels always arbitrary, subjective and culture-bound, or can it have some objective basis in human nature?
- PHL 216S **Deviance and Abnormality** 3L VL1:MWF10, L2:TR12, F1
The same as PHL 216F.
- PHL 220F **Belief, Knowledge and Truth** 3L L1:MWF3, L2:M7.30-9.30p.m.
We examine among other things certainty, the problem of skepticism, the scope and limits of human knowledge, the subjectivity of perception, rationality, and theories of truth.
Exclusion: PHI 252F
- PHL 230F **Existentialism and Phenomenology** 3L L1:MWF11, VL2:MWF3, L3:R7.30-9.30p.m.
Dominating European philosophy in the last decades, the phenomenologists and existentialists have influenced theology, psychology, anthropology, literature and art. Several thinkers are studied, with emphasis on the sense of human existence, creativity and freedom.
Exclusion: PHI 240S
- PHL 230S **Existentialism and Phenomenology** 3L L1:MWF10, L2:TRF1
The same as PHL 230F.
- PHL 231S **The Philosophy of Jean-Paul Sartre** 3L VL1:MWF12, L2:MWF2
A study of Sartre's early existentialism as expressed in fiction, theatre and philosophy, and of his developing Marxism and political engagements.

- PHL 232S **The Philosophy of Bertrand Russell** 3L L1:MWF10, L2:TRF1
A study of Bertrand Russell's theories about human knowledge, politics, and society.
- PHL 233S **Conflict in Contemporary Philosophy** (Not offered 1973-74) 3L
A study of conflicting and often hostile viewpoints as to the nature of philosophy and the correct methods of doing philosophy. Emphasis will be upon sympathetic presentation of opposing points of view.
- PHL 240F **The Birth of Western Philosophy I** 3L L1:MWF10, TL2:TR12, F1, L3:M7.30-9.30p.m.
Plato and His Predecessors. The course will cover the development of Presocratic philosophy from a mythical view of nature through the rationalistic systems of Parmenides and the Atomists and other Pluralists, to the moral, epistemological and metaphysical views of Socrates, the Sophists and Plato.
Exclusion: PHI 200
- PHL 241S **The Birth of Western Philosophy II** 3L L1:MWF10, TL2:TR12, F1, L3:M7.30-9.30p.m.
Aristotle and His Successors. Among the topics to be discussed: Aristotle: the nature of the physical universe; man in society; the justification of moral values; basic concepts in metaphysics; formal and informal logic. Epicurus: the atomic theory of matter; theory of knowledge; pleasure as a way of life; is man a free moral agent? The Stoics: The nature of the physical universe, fatalism and free will; the development of logic. Plotinus and the neo-Platonists.
Exclusion: PHI 200
- PHL 242F **Mediaeval Philosophy** 3L:MWF11
Exclusion: PHI 210
- PHL 243F **The Age of Reason: 17th Century Thought** 3L L1:MWF12, L2:MWF3
Galileo, Descartes, Leibniz and Newton were the key figures in a scientific and philosophical revolution. Men were forced into a radical rethinking of the powers of reason the limits of experience, and the nature of man and society in a scientific world. Among the philosophers who dominate this period are Descartes, Hobbes, Leibniz, Locke and Spinoza. Some of the period's minor intellectual figures will also be examined.
Exclusion: PHI 220
- PHL 244S **The Age of Enlightenment: 18th Century Thought** 3L L1:MWF12, L2:MWF3
The tension between reason and experience as the foundation of knowledge and morality is the theme of this period. Berkeley and Hume stretch the strict reliance upon experience to its logical limits leaving Kant to put the pieces back together in his "Copernican Revolution". This course will also include some of the period's minor intellectual figures.
Exclusion: PHI 220
- PHL 250F **Modern Symbolic Logic** 3L VL1:MWF11, L2:MWF12, L3:TRF1, L4:T7.30-9.30p.m.
Symbolic logic provides precise and efficient techniques for analyzing and evaluating arguments. This course is designed to enable the student to acquire basic skills in manipulating symbolic logic formulas and to gain some knowledge of the powers and limitations of formal systems.
Exclusion: PHI 290F
- PHL 250S **Modern Symbolic Logic** 3L TL1:MWF9, L2:MWF2, L3:TRF1
The same as PHL 250F.

- PHL 251S **Probability and Inductive Logic** 3L VL1:MWF11, L2:TRF1
How do we justify statistical inferences? What do we mean when we say that an event is probable or that some statement is probably true? We will examine a range of ideas on probability and induction current in the natural sciences, the social sciences, and mathematical and statistical literature.
- PHL 260F **Existence and Reality** 3L:MWF10
In perceiving, categorizing and classifying reality, we employ certain very basic concepts. We will discuss problems in metaphysics arising in connection with one or more of these concepts: existence, being, space, time, identity, causality, mind, and value.
Exclusion: PHI 255S
- PHL 261F **Philosophy of Religion** 3L L1:MWF10, L2:MWF2
An introduction to some of the following topics: the nature of religion, religious faith, arguments for God's existence, religious experience, religion and human autonomy, the problem of evil, religious and atheistic existentialism.
Exclusion: PHI 280
- PHL 261S **Philosophy of Religion** 3L L1:MWF3, L2:W7.30-9.30p.m.
The same as PHL 261F.
- PHL 262S **Philosophy of Judaism** 3L:MWF10
Jewish faith and experience have met with philosophic thought under a variety of conditions. We will consider problems which have arisen in mediaeval, modern, and contemporary settings.
- PHL 270F **Miracles, Mysticism, and the Occult** 3L VL:MWF11
Philosophy looks at the paranormal; we will discuss such topics as the concept of a miracle, mysticism, philosophical implications of E.S.P. and the "occult sciences".
- PHL 270S **Miracles, Mysticism and the Occult** 3L VL:MWF3
The same as PHL 270F.
- PHL 271F **Science and Society** 3L:MWF2
A course specially designed for students with some background in the sciences, which will undertake a philosophical examination of the role of the scientist, technologist, and engineer in contemporary society, including some of the following problems: pollution and its control, war research, the "think tank", technocracy, nationalism.
- PHL 272S **Science and Philosophy** 3L VL:MWF2
Advances in the physical, social, and life sciences have implications for a wide range of familiar concepts: explanation, theory, and evidence; cause and effect; space and time; purpose, motive, and freedom; man and animal. Philosophers have attempted to understand and systematize these implications. This course will examine some of these attempts.
Exclusion: PHL 295S
- PHL 280F **Persons, Minds and Bodies** 3L:MWF9
What is a person? Is a person a body animated by a mysterious ghostly entity called a "mind" or a "soul"? Or should we say that when we talk of minds we are *really* talking about brains or about behaviour? We will examine criteria of identity of persons at different times and the justification of claims that the bodies we see are bodies of persons having thoughts and experiences like our own.

- PHL 281S **Philosophical Psychology** 3L:MWF9
 Are some problems in psychology fundamentally conceptual in nature and not amenable to solution by the experimental method? Modern philosophical techniques are introduced and used to throw light on this question and others that arise where philosophy and psychology overlap.
- PHL 282S **Language and Communication** 3L:MWF2
 We will discuss the nature of language as a system of human communication, theories of meaning and meaningfulness, and the relation of language to the world and to the human mind.
- PHL 283F **The Analysis of Propaganda** 3L VL:MWF11
 A philosophical examination of various techniques of persuasion including psychological warfare, indoctrination, brainwashing, and advertising. Topics include the emotive use of language, persuasive definitions, informal fallacies, the dangers of statistics, the ethical presuppositions of propaganda, and the relevance of contemporary analysis of morality to propaganda wars.
- PHL 283S **The Analysis of Propaganda** 3L:MWF12
 The same as PHL 283F.
- NOTE: Courses numbered 290-299 are introductory lecture courses offered in areas not standardly covered. Topics will not necessarily be offered under these numbers each year.
- PHL 295S **Philosophy of Love, Hate and Other Emotions** 3L:MWF12
 An examination of emotion, using love, hate, and anxiety as major illustrative examples. This course will be concerned with the general theory of emotion, and discussion of historical theories will be based upon contemporary analyses. A careful reading of Kenny, Ryle, Sartre, Freud, Wittgenstein and some journal articles will be essential. Students will also be expected to acquaint themselves with some of the experimental investigations in contemporary psychology.
- PHL 296F **Michael Polanyi's Theory of Knowledge** 3L:MWF12
 Is intellectual discovery simply a matter of uncovering what was previously concealed from the minds of men? Michael Polanyi claims that it is not: the knower "participates" in shaping what he knows. This participation is not a flaw in our knowledge but is rather its great strength. The course will critically examine Polanyi's writings, particularly *Personal Knowledge* and *The Tacit Dimension*, and will pursue their implications for the sciences, the arts, politics, and social commitment.
- NOTE: The general prerequisite for 300-level courses is three half courses in philosophy (100-level courses count as two half courses). However, where a particular course is specified by number as a prerequisite only that course is required.
- PHL 300S **Contemporary Ethical Theory** 3L VL:MWF2
 An investigation of current trends and problems in the fields of moral philosophy and metaethical theory.
Exclusion: PHI 360S
Prerequisite: Three half courses in philosophy (PHL 200 F/S, 201 F/S recommended)
- PHL 301F **Freedom, Responsibility, and Human Action** 3L VL:MWF2
 Can men be free or responsible if human action is scientifically explained and predicted?
Prerequisite: Three half courses in philosophy

- PHL 310S **Contemporary Political Philosophy** 3L:MWF10
 An investigation of current trends and problems in the field of political philosophy.
Prerequisite: Three half courses in philosophy (PHL 210 F/S, 211 F/S, 212 F/S recommended)
- PHL 311S **Philosophical Problems of Revolutionary Thought** (Not offered 1973-74) 3L
 A philosophical study of political radicalism.
Prerequisite: Three half courses in philosophy (PHL 212 F/S, 310S recommended)
- PHL 312F **Philosophy of Law** 3L L1:MWF12, L2:MWF2
 The nature of law, and its relation to coercion on the one hand and to morality on the other.
Prerequisite: Three half courses in philosophy or three courses in social science or law
- PHL 313F **Games, Decisions and Social Choice** 3L:MWF11
 An examination of formal theories of decision, games, social choice and utility, and their relationship to problems in moral, political, and social theory.
Prerequisite: Three half courses in philosophy
- PHL 314S **Philosophy of Social Science** 3L:TR2, F1
 An examination of philosophical problems arising in social-scientific methodology: e.g. the scope of social science, subjectivism, individualism, determinism and social change, the nature and use of models and theories, explanation in approaches like Functionalism and Behaviourism, objectivity.
Prerequisite: Two courses in the social sciences
- PHL 315F **Philosophy of History I** 3L:MWF2
 The philosophy of history studies general theories about the nature of the human past and basic methodological problems in historical research and writing. Such questions are asked as: Has history any meaning? Can there be general theories of history? How are the findings of historians related to the theories of metaphysics and of science? Is history deterministic? Must the historian make value judgements? Is history a science or an art? Are there historical forces or spirits of an epoch?
Prerequisite: Three half courses in philosophy or three courses in history
- PHL 316S **Philosophy of History II** (Not offered 1973-74) 3L
Prerequisite: PHL 315
- PHL 320S **Theory of Knowledge** 2S TS:N
 A seminar course dealing with specific problems in the theory of knowledge; e.g., perception, necessary truth, knowledge and belief, and induction.
Exclusion: PHI 352
Prerequisite: Three half courses in philosophy (PHL 220F recommended)
- PHL 330S **Problems in Existentialism and Phenomenology** 3L L1:MWF11, VL2:R7.30-9.30p.m.
 We will examine either a problem or a particular philosopher's thought (e.g., Husserl, Merleau-Ponty, Heidegger) in order to deepen the student's understanding of some form of phenomenological method.
Exclusion: PHI 340
Prerequisite: PHL 230F/S or 344F

- PHL 340F **Plato** 3L:MWF3
 Some of the topics to be discussed are: What (if anything) is knowable; how does the answer affect our views of man and society? What are the implications for man of a dualistic answer to the problem of the relationship between mind and body? Are some basic problems discussable only in terms of myth, rather than of reason? What facts about the world, and its operations, or about man and his activities, can be said to offer grounds for a philosophy of optimism or pessimism?
Exclusion: PHI 300
Prerequisite: PHL 240F
- PHL 341S **Aristotle** 3L:MWF3
 Some of the topics to be discussed are: What state of affairs is described when we claim to know anything? Are there any "rules" of thought that all men (would) accept as a basis for right thinking? The philosophical utility of the concepts of causality, matter and form, act and potency; what it is to be wise in thought and action; man in society; mechanism and teleology.
Exclusion: PHI 300
Prerequisite: PHL 241S
- PHL 342F **The Rationalists** 3L TL:MWF2
 A systematic examination of the central philosophical problems in Descartes, Leibniz, and Spinoza.
Exclusion: PHI 320F
Prerequisite: Three half courses in philosophy
- PHL 343S **The Empiricists** 3L TL:MWF2
 A systematic examination of the central philosophical problems in Locke, Berkeley and Hume.
Exclusion: PHI 320F
Prerequisite: Three half courses in philosophy
- PHL 344F **Kant** 3L TL1:MWF9, L2:MWF11
 A systematic study of *The Critique of Pure Reason*
Exclusion: PHI 323F
Prerequisite: Three half courses in philosophy (PHL 243F, 244S, 342F, 343S recommended)
- PHL 345S **Hegel** 3L TL1:MWF9, L2:MWF11
 A systematic examination of central problems in the doctrines of Hegel.
Exclusion: PHI 333S
Prerequisite: PHL 344F
- PHL 346F **Nineteenth Century German Philosophy** 3L:MWF11
Exclusion: PHI 330S
Prerequisite: PHL 344F or three half courses in philosophy (PHL 320S, 340F, 342F, 360S recommended)
- PHL 347F **Nineteenth Century Anglo-American Philosophy** 3L:MWF12
 A study of such philosophers as Mill, Bradley, Pierce and James.
Prerequisite: Three half courses in philosophy
- PHL 348S **Twentieth Century British Philosophy** 3L:MWF12
 Russell, Moore and Wittgenstein.
Exclusion: PHI 343
Prerequisite: PHL 250F/S

- PHL 350S **Intermediate Logic: Provability and the Undecidable** 3L L1:TRF1, L2:T7.30-9.30p.m.
Advanced work in modern symbolic logic covering such topics as the scope and limits of proofs in formal systems, and the limitations of computability.
Prerequisite: PHL 250 F/S
- PHL 351F **Philosophy of Logic and Mathematics** 3L:MWF12
Some or all of the following topics will be discussed from a semi-formal point of view: Platonism versus nominalism, relation between logic and mathematics, epistemological implications of Gödel's and Church's theorems, counterfactuals, necessity and possibility, extensional and intensional contexts, synonymy, intuitionism, constructivity.
Exclusion: PHI 329S
Prerequisite: PHL 250F/S
- PHL 352F **Modal and Many-Valued Logics** 3L:MWF2
Prerequisite: PHL 250F/S
- PHL 353S **Set Theory** (Not offered 1973-74) 3L
Set theory is simultaneously the source and the solution of philosophical and mathematical paradoxes. In addition it is thought by many to be the mathematics underlying all of mathematics.
Prerequisite: PHL 250F/S
- PHL 354S **Philosophical Use of Logic** (Not offered 1973-74) 3L
Exploration of the interactions between logical theory and metaphysics, ethics and the foundations of mathematics and language, focussing on the impact of radical variations in the conceptual frameworks offered by alternative logical theories.
Prerequisite: PHL 250F/S
- PHL 360S **Metaphysics** 2S VS:N
A seminar course dealing with specific problems in metaphysics; e.g. space and time, existence, change and substance.
Exclusion: PHI 355
Prerequisite: Three half courses in philosophy (PHL 260F recommended)
- PHL 361S **Problems in the Philosophy of Religion** (Not offered 1973-74) 3L
A systematic examination of specific problems in the philosophy of religion.
Exclusion: PHI 380F
Prerequisite: PHL 261F/S
- PHL 370F **Philosophy of Natural Science** 3L:TR12, F1
An analysis of some of the theoretical and methodological assumptions of the physical sciences.
Exclusion: PHI 395F
Prerequisite: Three half courses in philosophy (PHL 272S recommended) or one course in the natural sciences or mathematics.
- PHL 380S **Minds and Machines** 3L VL:MWF11
Can machines think and feel? Are human beings simply very complicated biochemical devices, perhaps of a sort that future technology may be able to simulate? We deal with these questions in the light of recent research and discussion on the possibilities of simulation of intelligence and purposive behaviour.
Prerequisite: PHL 250 F/S

NOTE: Courses numbered 390-395 are advanced lecture courses in areas not standardly covered. Topics will not necessarily be offered under these numbers each year.

- PHL 393F Two contemporary Theories of Man** 3L:MWF12
 This course will provide an introduction to psychoanalysis (Freud and his successors) and to existentialism (Sartre and Merleau-Ponty) with special emphasis on the nature of consciousness, the nature of motivation, the causality of behaviour, and the interpretation of experience.
Prerequisite: Three half courses in philosophy
- PHL 394S Kant's Ethics and Theory of Rights** 3L:MWF9
 Mention is often made of Kantian ethical notions: the categorical imperative, treating men as ends, the natural right of all men to freedom, the dignity of men. This course will examine the meaning Kant gives to these and the support he offers for them.
Prerequisite: Three half courses in philosophy (including at least one half course in ethics)
- PHL 396F/S Special Tutorial in Epistemology** 2S:N
 A concentrated examination of central problems in epistemology, e.g. necessary truth, perception, knowledge and belief. Not more than three students will be assigned to each tutor.
Prerequisite: Three half courses in philosophy
- PHL 397 F/S, 398 F/S, 399 F/S Special Tutorial** 2S:N
Prerequisite: Three half courses in philosophy
- NOTE:** The general prerequisite for 400-level courses is six half courses in philosophy (100-level courses count as two half-courses), some of which must be in the area in which the course represents advanced study, or, alternatively, permission of the instructor. Individual instructors are free to assign specific prerequisites. For details of these course, students should consult the Department *Handbook*.
- PHL 400F Advanced Topics in Ethics** (Not offered 1973-74) 2S
- PHL 401F Advanced Topics in Aesthetics** (Not offered 1973-74) 2S
- PHL 410F Advanced Topics in Political Philosophy** 2S:N
- PHL 411F Advanced Topics in the Philosophy of Education** (Not offered 1973-74) 2S
- PHL 412S Advanced Topics in Philosophy of Social Science** (Not offered 1973-74) 2S
- PHL 413F Philosophy of Psychology** 2S:N
- PHL 420F Advanced Topics in Epistemology** (Not offered 1973-74) 2S
- PHL 430S Advanced Topics in Existentialism and Phenomenology** (Not offered 1973-74) 2S
- PHL 440F Advanced Work in History of Philosophy** 2S:N
- PHL 440S Advanced Work in History of Philosophy** 2S:N
- PHL 450F Advanced Topics in Logic** (Not offered 1973-74) 2S
- PHL 451S Advanced Topics in Philosophy of Logic** 2S:N

PHL 452F	Advanced Topics in Philosophy of Mathematics	(Not offered 1973-74) 2S
PHL 460S	Advanced Topics in Metaphysics	2S:N
PHL 470F	Advanced Topics in Philosophy of Science	2S:N
PHL 471S	Philosophy of Physics	(Not offered 1973-74) 2S
PHL 472S	Philosophy of Biology	2S:N
PHL 480S	Theory of Action	2S:N
PHL 481F	Advanced Topics in Philosophy of Mind	2S:N
PHL 482S	Advanced Topics in Philosophy of Language	(Not offered 1973-74) 2S

NOTE: Courses numbered 490-495 are advanced seminars in areas not standardly covered. Topics will not necessarily be offered under these numbers each year.

PHL 496F, 497S, 498F, 499S **Individual Studies** N
 A project of reading and research, supervised by a faculty member. Proposed projects must be approved by the Department and are subject to the availability of a faculty supervisor. See Department *Handbook* for details.

PHY

PHYSICS

<i>Chairman of Department:</i>	Professor J.M. Daniels
<i>Associate Chairman, Undergraduate Studies:</i>	Professor R.L. Armstrong
<i>Enquiries:</i>	McLennan Physical Laboratories, Room 328 (928-2936)

Physics is the study of natural phenomena at their most fundamental level. Physics concerns itself with such topics as motion, gravitation, electromagnetism, radiation, the properties of solids, liquids and gases, the structure and behaviour of molecules, atoms and nuclei, the elementary particles, the earth, its environment and beyond.

The study of physics can lead directly or indirectly to a wide variety of career opportunities. To pursue fundamental research in a university, government or industrial laboratory a programme of graduate studies is almost essential. Students with undergraduate specialist degrees in physics might, for example, find employment as teachers of physics in secondary schools, as representatives for science oriented companies, as research assistants in industrial laboratories carrying out research and development, as exploration geophysicists or as meteorologists. Students with a general background in physics can find applications for their knowledge in such areas as the health sciences, operations research, science journalism and patent law.

Since a concise and quantitative description of most physical phenomena can be achieved only in mathematical terms, a good knowledge of mathematics is essential for proper understanding of physics, and many of the Physics courses in these packages demand corresponding Mathematics courses as pre- and co-requisites.

The specialist programmes in Physics, and Physics and Mathematics, comprising physics courses in the X5X series, are designed mainly for students who expect to continue their study of physics to the graduate level. Each contains a set of core physics courses which are considered to contain most of the basic knowledge which ought to be possessed by anyone who wishes to specialize in physics or any related subject. These specialist programmes may be entered via PHY 150 by students with

standing in Grade XIII Mathematics and Physics, or alternatively via PHY 130 with some additional work. In the Physics programme about half of the courses in the second, third and fourth years are specified; in the Physics and Mathematics programme almost all are specified.

Alternatively the student may, in addition to core physics courses, take courses in other subjects, either to acquire a combined specialization or to broaden his background. For example, the specialist programme in Astronomy and Astrophysics consists of the Physics core plus a number of courses in Astronomy normally taken in the Third and Fourth year. There is also a Chemical Physics programme, a Physics and Geology programme and a Physics and Philosophy programme. These suggested programmes are listed in this Calendar under the heading 'B.Sc. Programmes'. Other programmes, for example, Physics and Biology, may be easily constructed in consultation with the relevant Departments. The variety and flexibility of the options open to the student is intended to enable him to plan a programme that best suits his needs.

For those who do not wish to specialize in Physics but nevertheless require basic knowledge of the subject, the Department offers a three-course programme (PHY 130, 230 and 330).

The Department also offers PHY 110, a general course for science students, and PHY 100, which is a course about physics intended for those who wish to become acquainted with physical ideas and thought rather than to learn physics as a subject.

In order to aid the student in his choice of courses a rationalized numbering scheme is used. The first digit of the course number designates the year of study in which the course would normally be taken, the second digit indicates the type of student who would most benefit from the course and the third digit distinguishes between courses within each category. The numbering scheme is as follows:

- X00 - X09—for non-science students
- X10 - X19—for non-specialist science students
- X20 - X29—laboratory courses
- X30 - X39—for physical science specialist students
- X40 - X49—for earth science specialists
- X50 - X69—for physics specialists
- X70 - X79—individual study programmes

Undergraduate students play an important role in the decision-making process in the Department. This participation includes representation on the Departmental Council (the senior policy making body), the Undergraduate Affairs Committee (which discusses changes to the curriculum), the Library Committee and Individual Course Councils.

NOTES:

- 1 The reference book(s) listed at the end of a course description will not necessarily be the text(s) for the course. It will, however, give an indication of the level at which the course is to be presented.
- 2 The designated pre- or co-requisites are strongly recommended but are often waived by the Department in special circumstances.
- 3 The Department produces an up-to-date brochure describing the undergraduate programme, the functioning of the Department, the lecturers associated with each course and the people available for information or counselling. Students are urged to secure a copy of this booklet from the Department Office at the beginning of term.

100-SERIES COURSES

PHY 100 **Physics in Today's World**

2L:MW11, 1T:F11

This course describes what physics is and what motivates physicists, what physics' characteristic method of reasoning is, where physics fits into the spectrum of knowledge, what its contribution to our culture and heritage is, how it fits into present society and how it may play a role in tackling today's problems. This course is designed for students specializing in the humanities and social sciences.

- PHY 110 **Basic Physics I** (Formerly PHY 140) 2L, 1½P, 1T
 L1:TR9, L2:TR11, L3:TR12
 OP1:M2-5, NMP2:T2-5, ITOP3:W2-5, UVP4:R2-5, P5:F9-12
 T:N

A one year course in physics for science students who require an introduction to the subject. Topics discussed include kinematics, dynamics, gravitational, electrical and magnetic forces, planetary motions, relativity, wave motion, quantum concepts, atomic theory and nuclear physics. See description of laboratory after PHY 150.

Reference: Borowitz and Bornstein, *A Contemporary View of Elementary Physics*

Exclusion: PHY 111, 130, 150

Prerequisite: XIII MAT Functions and Relations, or Calculus

Co-requisite: MAT 130/135/139

- PHY 111 **Basic Physics II** 2L, 1½P, 1T
 L1:TR9, L2:TR12
 OP1:M2-5, NMP2:T2-5, ITOP3:W2-5, UVP4:R2-5, P5:F9-12
 T:N

The material covered is the same as PHY 110. However, it is not open to students who have recently completed XIII PHY.

Reference: Borowitz and Bornstein, *A Contemporary View of Elementary Physics*

Exclusion: PHY 110, 130, 150

Prerequisite: XIII MAT Functions and Relations

Co-requisite: MAT 130/135/139

- PHY 130 **Mechanics, Waves and Matter** 2L, 1½P, 1T
 L1:TR9, L2:TR11, L3:TR12
 OP1:M2-5, NMP2:T2-5, ITOP3:W2-5, UVP4:R2-5, P5:F9-12
 T:N

A first physics course at an intermediate level for science students. The material to be discussed includes the description of the motion of a single particle, the effect of forces on the motion of a single particle, simple harmonic motion and wave motion, planetary motions and molecular motions and statistical and quantum concepts. See description of laboratory after PHY 150.

Reference: Armstrong and King, *Mechanics, Waves and Thermal Physics*.

Exclusion: PHY 110, 111, 150

Prerequisite: XIII MAT Functions and Relations and Calculus (Students without XIII PHY will have to work extra hard)

Co-requisite: MAT 135/139/(140, 150)

- PHY 150 **Elementary Mechanics** (Formerly PHY 120) 2L, 1½P, 1T
 INTVL1:TR9, UML2:TR12
 OP1:M2-5, NMP2:T2-5, ITOP3:W2-5, UVP4:R2-5, P5:F9-12
 T:N

A concentrated course in mechanics for students with considerable ability in mathematics and physics. The emphasis is on obtaining a solid working knowledge of classical and relativistic mechanics. Laboratory experience forms part of the course. See description of laboratory which follows.

Reference: Kittel, Knight and Ruderman, *Mechanics; Berkeley Physics Course, Vol. I.*

Exclusion: PHY 110, 111, 130

Prerequisite: XIII MAT Functions and Relations, Calculus, Algebra and XIII PHY

Co-requisite: MAT 139/(140, 150)

NOTE: First Year Laboratory. Taken by all students enrolled in PHY 110, 111, 130, 150. An introductory course in experimentation, starting with a selected experiment which each pair of students is obliged to complete but thereon offering choices. Emphasis is on the general principles of experimentation: planning, use of instruments, error estimation, data analysis and comparison with theory, the keeping of complete records, and genuine exéloratory work. Laboratories are given in alternate weeks.

Reference: Baird, *Experimentation*

200-SERIES COURSES

- PHY 215F Geophysics** (Formerly PHY 225F) 2L:TR3
 A course in the Physics of the earth, atmosphere and magnetosphere, offered to students in science. The principal conclusions reached by geophysicists about the planet, its evolution, and the processes taking place on it are introduced, as well as an outline of the methods utilized in attacking current research problems.
References: Flohn, *Weather and Climate*; Gass, Smith and Wilson, *Understanding the Earth*.
Prerequisite: PHY 110/111/130/150, GLG120
- PHY 218 Applications of Physics in Medicine** (Formerly PHY 228 (1972-73)) 2L:TR3, 1T:F3
 This course covers particular parts of physics which are often applied in medical practice and research and intimately mixes the pure with the applied physics. Topics include: radioactivity and tracer techniques, neutron activation analysis, optics and the resolution of instruments, x-rays and holography, electricity and instruments used in medicine, mechanics of the body, hydrodynamics of the circulating system.
Prerequisite: PHY 110/111/130
- PHY 226Y Physics Laboratory** (Formerly PHY 240Y) 3P:R9-12
 The purposes of this laboratory and its mode of operation are essentially identical to those of the first year laboratory, except that students beginning this course should have a background in experimentation. The emphasis is on electromagnetism and wave phenomena, though a number of more advanced experiments are also available.
Exclusion: PHY 230
Prerequisite: PHY 130/150
Co-requisite: PHY 250/251S
- PHY 230 Electromagnetism, Waves and Optics** 2L, 1½P, 1T L1:TR2, L2:M6-9.30p.m., P:T9-12, T1:N
 A lecture and laboratory course in electricity, magnetism and optics. The subject matter, which is derived from fundamental principles, includes electrostatics, electric and magnetic fields, DC and AC circuits, Maxwell's equations, waves, geometric and physical optics. For a description of the laboratory, see PHY 226Y. Laboratories are given in alternate weeks.
Reference: Halliday and Resnick, *Physics*, Part II
Exclusion: PHY 250/226Y
Prerequisite: PHY 110/111/130/150
- PHY 244S Elasticity and Fluid Mechanics** (Formerly PHY 224S) 2L:TR2
 A mathematical course in classical physics particularly for those interested in geophysics and meteorology. The elasticity part includes the definition and use of cartesian tensors to describe infinitesimal strains, stresses, and their relations. Fluid mechanics, includes fluid statics, continuity, Bernoulli, Euler, and Navier-Stokes equations, potential flow, vortex flow.
Reference: R.R. Long, *Mechanics of Solids and Fluids*; D.R.F. Harleman, *Fluid Dynamics*.
Prerequisite: PHY 130/150
Co-requisite: MAT 235/239/250
- PHY 250 Electromagnetism** (Formerly PHY 220) 2L, 1T:MWF10
 A course in electromagnetism considered to be part of the physics core curriculum. Fields are emphasized rather than circuits. The electric field of moving charges is used to develop the properties of the magnetic field. Maxwell's equations are established and solutions are obtained for the case of plane waves.
References: Purcell, *Electricity and Magnetism*; *Berkeley Physics Course* Vol. II
Exclusion: PHY 230
Prerequisite: PHY 130/150
Co-requisite: MAT 235/239/250 (MAT 244F and APM 346S)/APM 251

- PHY 251S Waves** (Formerly PHY 221S) 2L, 1T:MWF11
 A core physics course on wave motion and oscillations. Topics include: normal modes of oscillation, free and forced oscillation of systems with many degrees of freedom, dispersion relations, resonance, travelling waves, reflection, impedance, modulation, pulses, wave packets, polarization, interference and diffraction.
References: Crawford, *Waves*; *Berkeley Physics Course Vol. III*
Exclusion: PHY 230
Prerequisite: PHY 130/150
Co-requisite: MAT 235/239/250, (MAT 244F and APM 346S)/APM 251
- PHY 252F Thermal Physics** (Formerly PHY 222F) 2L, 1T:MWF11
 A core physics course. Characteristic features of macroscopic systems, basic probability notions, the postulates of statistical theory, entropy, absolute temperature, the canonical distribution and the laws of thermodynamics are discussed.
References: Reif, *Statistical Physics*; *Berkeley Physics Course*, Vol. V
Prerequisite: PHY 130/150
- PHY 253S Introduction to Theoretical Physics** (Formerly PHY 223S) 2L:MW12, 1T:F12
 This course is designed to provide an enrichment for theoretically inclined physics students and has both a mathematical and a philosophical orientation. Topics discussed include frames of reference, vector and tensor calculus, distributions and fields. Examples are drawn from many areas of classical and quantum physics, including relativity.
Prerequisite: PHY 150
Co-requisite: MAT 235/239/250

300-SERIES COURSES

The Department of Physics offers general seminars and will provide staff advisers during the spring term for students taking 300-series courses. There is no credit given for attendance.

- JPA 300 Physics and Archaeology**
 (See JPA under "Joint Courses")
- PHY 324Y Geophysics Laboratory I** 3P:F9-12
 A laboratory course in geophysical prospecting methods, to accompany PHY 338 or PHY 443. Assignments are designed to demonstrate how theory is applied to field situations. For students in PHY 338, the programme consists of weekly assignments that follow the lecture course. For students in PHY 443, the programme consists of a 10-day field camp held just before term begins. The cost of food and transportation for this camp will not exceed \$40 per student. During term the data taken in field camp are interpreted.
Prerequisite: (PHY 250, 251S)/230, MAT 230/235/239
Co-requisite: PHY 338/443
- PHY 325 Modern Physics Laboratory** 6P:TR9-12
 Experiments of both a pure and applied nature are available in the areas of atomic, molecular, solid state, nuclear and particle physics. The experiments are open-ended; the student may spend more or less time on any particular experiment depending on his particular interest. The laboratory is open five days a week. Demonstrators will be in the lab at the times shown in the timetable and available for consultation at other times. A core course. Registration at the Physics office first week of term.
Exclusion: PHY 326Y, 327F, 328S
Prerequisite: PHY 226Y
- PHY 326Y Modern Physics Laboratory** 3P P1:T9-12, P2:R9-12
 This course is one-half of PHY 325.
Exclusion: PHY 325, 327F/328S
Prerequisite: PHY 226Y

- PHY 327F **Modern Physics Laboratory** 6P:TR9-12
 This course is one-half of PHY 325.
Exclusion: PHY 325, 326Y
Prerequisite: PHY 226Y
- PHY 328S **Modern Physics Laboratory** 6P:TR9-12
 This course is one-half of PHY 325.
Exclusion: PHY 325, 326Y
Prerequisite: PHY 226Y
- PHY 330 **Atomic and Nuclear Physics** (Formerly PHY 301) 3L:W6.30-9.30p.m.
 Review of special relativity. Introduction to quantum physics. Hydrogen atom. Electron spin, Zeeman effect. Two electron atom. Angular momentum, L-S coupling. Many electron atoms, periodic table. Molecules, bonding. H₂⁺ and H₂ systems. Atomic nucleus, radioactivity, nuclear reactions. Elementary particles.
Reference: Tipler, *Foundations of Modern Physics*
Prerequisite: PHY 230/250
Co-requisite: APM 331F/MAT 244F
- PHY 331F **Electric Circuits and Introductory Electronics** (Formerly PHY 311) 2L:MW11, 1½P:T9-12
 The analysis of DC and AC circuits including Kirchoff's laws, loop and node analysis, Thevinin's and Norton's theorems, complex impedance and admittance, coupled circuits, resonant circuits and Fourier analysis. The introduction to electronics includes semi-conductors and junction diodes, rectifiers and filters, transistors, two-part networks and basic transistor amplifiers. Laboratories are given in alternate weeks.
References: Edminister, *Electric Circuits*; Ryder, *Electronic Fundamentals and Applications IV Ed.*
Prerequisite: PHY 250/230
- PHY 332F **Molecular Biophysics** (Formerly PHY 309F) 2L:TR5
 The physical and chemical properties of some biologically important macromolecules in relation to their functions. Techniques such as sedimentation, chromatography, spectroscopy, scattering of photons and electrons. The course is designed to give students with a physics and chemistry background an insight into the application of the exact sciences to the solution of biological problems.
General Biology Reference: Watson, *Molecular Biology of the Gene*
Prerequisite: (PHY 250, 251S)/230
- PHY 333S **Cellular Biophysics** (Formerly PHY 310S) 2L:TR4
 The emphasis will be on the application of principles from physics, chemistry and genetics to quantitative studies in cell biology. Selected areas in biophysics such as cellular differentiation, the regulation of macromolecular biosynthesis, and the application of biophysical methods to problems in medicine, will be discussed in detail.
General Biology Reference: Watson, *Molecular Biology of the Gene*
Prerequisite: (PHY 250, 251S)/230
- PHY 334F **Introduction to Solid State Physics** (Formerly PHY 304S) 2L:MW10
 Introduction to the basic features of solid state physics including: crystal lattices, their structure and description; propagation of waves in periodic structures, including x-rays and neutron diffraction; properties of phonons and the behaviour of electrons in crystalline solids; the principal properties of metals, semi-conductors and insulators; some features of the magnetic behaviour of metals.
Prerequisite: (PHY 250/251S)/230

- PHY 335F Introduction to Nuclear Physics** (Formerly PHY 305F) 2L:TR1, 1T: evening
 Important discoveries in nuclear and particle physics. Properties of the nucleus and of nuclei. The measurement of atomic masses; nuclear binding energies, binding energy and mass formulas, liquid drop model and fission. Introduction to nuclear shell and collective models. Interaction of charged particles and uncharged particles with matter; particle detection, energy and momentum measurements. Radioactive decay phenomena; theory and experiment. Nuclear reactions and cross section. Particle accelerators.
Reference: Meyerhof, *Elements of Nuclear Physics*
Prerequisite: PHY 230/250
- PHY 336S Applied Nuclear Physics** (Formerly 307S) 2L:TR3, 1P:N
 Fission and fusion. Tracer techniques. Biological effects of radiation. Applications of nuclear techniques in various fields. Neutron and scintillation radiography. Activation analysis. Those taking PHY 325/326Y/328S concurrently meet the laboratory requirement.
Reference: Lapp & Andrews, *Nuclear Radiation Physics*
Prerequisite: PHY 335F/330
- PHY 337S Elementary Particle Physics** 2L:TR9, T evening
 A contemporary picture of the world of elementary particle physics. Introduction to the classification of particle states, types of interactions, experimental methods, conservation laws and invariance principles. Discussions to include weak, electromagnetic and strong interactions and to point out the unsolved problems that are currently being investigated.
Prerequisite: PHY 250/230
- PHY 338 Exploration Geophysics** (Formerly PHY 308) 2L:MW12, 2P:F9-11
 An introduction to the physical principles underlying the important methods of geophysical prospecting. Particular attention is given to seismic, gravitational, magnetic and electromagnetic methods. This course is designed primarily for geologists. Physics students see PHY 413.
Reference: Dobrin, *Introduction to Geophysical Prospecting*
Prerequisite: (PHY 250, 251S)/230, MAT 230/235/239
Co-requisite: PHY 324Y
- PHY 339S Electronics** (Formerly PHY 311) 2L:MW11, 1½P:T9-12
 Topics include DC bias and stability of transistor circuits, small signal RC amplifiers, feedback, direct-coupled amplifiers (operational amplifiers), oscillator principles, wave-shaping and switching and logical switching. A selection of the following topics will complete the course: AM and FM modulation and demodulation, pulse communication systems, transmission lines and microwave devices, wide band and frequency selective amplifiers, light sensitive devices. Laboratories are given in alternate weeks.
Reference: Ryder, *Electronic Fundamentals and Applications IV Ed.*
Exclusion: ELE 354S
Prerequisite: PHY 331F
- PHY 350 Quantum Physics** (Formerly PHY 300) 2L, 1T:MWF3
 Schroedinger's theory of quantum mechanics, perturbation theory, one-electron atoms, magnetic moments, spin and relativistic effects, identical particles, multi-electron atoms, transition probabilities. Examples will be taken from atomic physics, molecular physics, and to a smaller extent nuclear and particle physics. A core course.
References: Anderson, *Modern Physics and Quantum Mechanics*; McGervey, *Introduction to Modern Physics*
Exclusion: PHY 330
Prerequisite: PHY 250, 251S
Co-requisite: APM 251/MAT 244F/(MAT 334F and APM 346S)/MAT 319S

- PHY 351F Classical Mechanics** 3L:MWF1
 Variational principles and Lagrange's equations, Eulerian angles, rigid body equations of motion, Hamilton's equations of motion, Hamilton-Jacobi theory. This is a core course.
Reference: Goldstein, *Classical Mechanics*
Prerequisite: (MAT 244F and APM 346S)/APM 251
- PHY 352 Electromagnetic Fields and Waves (Formerly PHY 302)** 2L:TR2
 Electrostatics, Maxwell's equations for free space (with sources) and for macroscopic media; electromagnetic energy density and flux; plane electromagnetic waves in dielectrics, conductors and plasmas; evanescent waves; reflection and refraction at a plane interface; elementary wave guides; elementary plasma processes; Leinard-Wiechert potentials; radiation from dipoles; Thomson scattering; Cherenkov radiation. A core course.
Reference: Lorrain and Corson, *Introduction to Electromagnetic Fields and Waves*
Prerequisite: PHY 250, 251S
Co-requisite: APM 251 (MAT 244S and APM 346S) •
- PHY 353S Thermodynamics (Formerly PHY 303F)** 2L:TR1
 The general principles of classical thermodynamics are discussed and related to statistical physics. Representative applications in fluids, solids, magnetic systems and phase transitions are considered. A core course.
Reference: Zemansky, *Heat and Thermodynamics*, 5th Edition
Prerequisite: PHY 252F, MAT 235/239/250

400-SERIES COURSES

A programme including one or more of PHY 470-478 must be endorsed by the Department. The Department of Physics provides staff advisers for students taking 400-series courses. Weekly meetings with these advisers are encouraged. Students taking 400-series courses are invited to attend the Thursday afternoon Departmental colloquia.

- PHY 422F Geophysics Laboratory II (Formerly PHY 420Y)** 6P:M2-5,3hrs, N
 A laboratory concerned with mathematical and computational techniques for the analysis of discrete data series. Topics include Fourier, z and Laplace transforms in continuous and discrete representations, aliasing effects of sampling continuous functions, convolution and correlation, bandpass and optimum least squares filtering and estimation of power spectra.
Reference: Hsu, *Fourier Analysis*
Prerequisite: PHY 250, MAT 139/(140, 150)
Co-requisite: 338/442/443
- PHY 423S Geophysics Laboratory III** 3P:M2-5
 The course is a continuation of PHY 422F. Computational procedures for the interpretation and inversion of observations are investigated.
Prerequisite: PHY 422F
- PHY 424Y Geophysics Laboratory IV (Formerly PHY 421Y)** 3P:W3-5
 Project Laboratory.
Prerequisite: PHY 250, 251S
Co-requisite: PHY 338/442/443

- PHY 425 Quantum Physics Laboratory** 6P:MW2-5
 This laboratory is basically a continuation of PHY 325. Experiments similar to those of PHY 325 are available but at a more advanced level. In addition several experiments of a research nature may be undertaken outside the laboratory. The laboratory is open five days a week. Demonstrators will be available in the lab. at times shown in the timetable and available for consultation at other times. Registration at the Physics office first week of term.
Exclusion: PHY 426Y, 427F, 438S
Prerequisite: PHY 325/326Y/327F/328S
- PHY 426Y Quantum Physics Laboratory** 3P P1:M2-5, P2:W2-5
 This course is one-half of PHY 425.
Exclusion: PHY 425, 427F/428S
Prerequisite: PHY 325/326Y/327Y/328S
- PHY 427F Quantum Physics Laboratory** 6P:MW2-5
 This course is one-half of PHY 425.
Exclusion: PHY 425, 426Y
Prerequisite: PHY 325/326Y/327F/328S
- PHY 428S Quantum Physics Laboratory** 6P:MW2-5
 This course is one-half of PHY 425.
Exclusion: PHY 425, 426Y
Prerequisite: PHY 325/326Y/327F/328S
- PHY 440F Aeronomy** 2L:MW9
 A detailed survey of the earth's atmosphere to its outermost reaches. Topics include: vertical variations of density, pressure, temperature and chemical composition through the troposphere, stratosphere, mesosphere, thermosphere and exosphere; ionized layers in the upper atmosphere; dynamic processes of the neutral gas and of the ionization, including the hydromagnetic interaction with the outflowing solar corona.
References: Hines et al, *Physics of the Earth's Upper Atmosphere*; Whitten and Popoff, *Fundamentals of Aeronomy*
Prerequisite: PHY 250, 251S, 252F
- PHY 441 Classical Physics of Continua (Formerly PHY 411)** 2L:TR10
 A course stressing the physical concepts underlying and the mathematical basis of continuum mechanics. Topics include deformation of continuous media, stress tensors, constitutive equations, viscosity, viscoelasticity, wave propagation, viscous hydrodynamics, stability theory, and possibly turbulence. The main emphasis is placed on problems relevant to the study of the earth.
Reference: Mase, *Continuum Mechanics* (Schaum's outline)
Prerequisite: PHY 150, PHY 252F/CHM 220, APM 331F/251/MAT 244F, APM 246S/APM 251/PHY 244S/PHY 351F
- PHY 442 Physics of the Earth (Formerly PHY 412)** 2L:T11, R2
 A course providing a physical background for the study of the interior of the earth and the moon and the development of their surface features. Topics include seismic waves and the earth's structure, the gravitational field and the earth's mass distribution, geomagnetism, geochronology, and the mechanical and thermal properties of the earth's interior. Recent results from the Apollo missions will be discussed.
References: Garland, *Physics of the Earth; Mantle, Core and Crust*; Stacey, *Physics of the Earth*
Prerequisite or Co-requisite: PHY 352, MAT 334F and AMP 346S

- PHY 443 **Theory and Application of Geophysical Methods** (Formerly PHY 413) 2L:TR1
 A course on the physical and mathematical theories of seismic, magnetic, electrical and gravitational methods in pure and applied geophysics. Considerable emphasis is placed on Fourier transform methods.
Reference: Grant and West, *Interpretation Theory in Applied Geophysics*; Parasnis, *Mining and Geophysics*
Prerequisite: PHY 250, 251S
Co-requisite: APM 346S/351/441, PHY 324Y
- PHY 444 **Atmospheric Physics** (Formerly PHY 414) 2L:TR9
 Meteorological measurements, radiation, atmospheric statics and conditions for equilibrium, atmospheric thermodynamics, equations of motion, synoptic charts, the general circulations, condensations, condensation physics, atmospheric electricity. Wind structure near the ground, evaporation. The stratosphere.
Reference: Haltiner and Martin, *Dynamic and Physical Meteorology*
Prerequisite: PHY 352, 353S/CHM 220
- PHY 450 **Quantum Theory** (Formerly PHY 400) 2L, 1T:MWF2
 Waves and particles, wave packets, uncertainty principle, Schroedinger equation, expectation values, operators, eigenvalues, eigenfunctions, matrix mechanics, angular momentum, central force problems, Pauli spin theory, identical particles, Pauli principle, applications to atoms and molecules. Zeeman effect. Perturbation theory, secular equations, time dependent perturbation theory, transition probabilities. Charged particles moving in electromagnetic fields, scattering theory.
Reference: Merzbacker, *Quantum Mechanics*
Prerequisite: PHY 350, 351F
- PHY 451 **Statistical Mechanics** (Formerly PHY 401) 2L:TR10
 Microcanonical, canonical and grand canonical distributions. Microscopic discussion of entropy, temperature and chemical potential. Ideal classical and quantum gases. Approach to equilibrium and irreversibility. Boltzmann equation and transport phenomena. Brownian motion, correlation functions, density fluctuations. Imperfect gases, mean field theory and phase transitions. Liquid helium, degenerate electron gas.
References: Kittel, *Thermal Physics*; Reif, *Fundamentals of Statistical and Thermal Physics*
Prerequisite: PHY 252F, 350/330
- PHY 452 **Relativity Theory** (Formerly PHY 410) 2L:TR12
 Special theory: principle of relativity, Lorentz transformations. Minkowski space, tensor algebra. Relativistic particle dynamics, collision theory. Relativistic field theory, hydrodynamics, Maxwell field, electrodynamics of material bodies, Klein-Gordon field. General theory: principle of equivalence, general covariance, tensor analysis. Einstein equations, Schwarzschild solution, geodesics, gravitational collapse, black holes. Geometro-dynamics, superspace, quantization of Einstein equations. Cosmology: cosmological models, Robertson-Walker metric, mix master universe.
Prerequisite: PHY 352
- PHY 453 **Nuclear Physics** (Formerly PHY 403) 2L:TR11
 Nuclear forces and scattering. The properties of nuclei and their description by means of the shell model and the collective model. Electromagnetic interaction with the nucleus. Weak interactions. The theory of nuclear reactions. The course will include some atomic and high energy physics in order to emphasize the important connections of both subjects with nuclear physics.
References: Eisberg, *Fundamentals of Modern Physics*; Paul, *Nuclear and Particle Physics*
Prerequisite: PHY 350

- PHY 454 **High Energy Physics** 2L:TR9
 Introduction to concepts and experimental methods of high energy or particle physics, with an emphasis on phenomenology. Topics include: particle accelerators and detectors, conservation laws and invariance principles in weak, electromagnetic and strong interactions, scattering theory, the production and decay of boson and baryon resonances, unitary symmetry and particle classification.
Reference: Perkins, *Introduction to High Energy Physics*
Prerequisite: PHY 350
Co-requisite: PHY 450
- PHY 455 **Solid State Physics (Formerly PHY 405)** 2L:MW12
 Crystal lattices, including lattice energies; wave propagation in periodic structures, including diffraction; phonons, thermal properties of solids, including specific heats, free electron theory, energy bands, Fermi surfaces, electronic transport properties, homogeneous semiconductors, superconductivity, magnetism in solids.
Reference: Kittel, *Introduction to Solid State Physics*, 4th Edition
Prerequisite: PHY 350
Co-requisite: PHY 450, 451F
- PHY 456 **Modern Optics and Radiation** 2L:TR1
 Production and propagation of electromagnetic radiation. Vectorial nature of light. Coherence and interference including interferometry. Diffraction including holography and the diffraction of x-rays. Optics of solids including nonlinear optics. Masers and lasers. Scattering of light—Rayleigh, Brillouin and Raman. Magnetic resonance—NMR, EPR, NQR.
Reference: Fowles, *Introduction to Modern Optics*
Exclusion: PHY 406F
Prerequisite: PHY 352
- PHY 457F **Group Theory and its Physical Applications I** 2L:TR2
 A discussion of abstract group theory and the theory of group representations with some illustrative examples of physical applications. The full rotation group and angular momentum is also included.
Reference: Tinkham, *Group Theory and Quantum Mechanics*
Exclusion: PHY 408F
Prerequisite: PHY 350/330/CHM 323S
Co-requisite: PHY 450/(CHM 422F, 424F)
- PHY 458S **Group Theory and its Physical Applications II** 2L:TR2
 The application of the techniques of group theory to several detailed topics taken from the fields of atomic, molecular and solid state physics.
Reference: Tinkham, *Group Theory and Quantum Mechanics*
Exclusion: PHY 408F
Prerequisite: PHY 457F
- PHY 470 **Introduction to Research in Physics (Formerly PHY 430)** Arranged
 An experimental or theoretical research problem under supervision of a member of the Physics staff. This course represents 1/5 of a normal work load. By special arrangement the research work may be carried out during the summer before the student enters 4th year. Departmental approval is required. Must meet general standards set by the Department.

- PHY 471 Supervised Readings I (Formerly PHY 431)** Arranged
A programme of individual study equal to 1/5 of a normal work load chosen by the student with the advice of, and carried out under the direction of a Physics staff member. A student may take advantage of this course either to obtain further specialization in a field of interest or to explore interdisciplinary fields not available in the regular syllabus. Departmental approval is required. Must meet general standards set by the Department.
- PHY 472Y Supervised Readings II (Formerly PHY 432Y)** Arranged
A programme of individual study equal to 1/10 of a normal work load chosen by the student with the advice of, and carried out under the direction of a physics staff member. A student may take advantage of this course either to obtain further specialization in a field of interest or to explore interdisciplinary fields not available in the regular syllabus. Departmental approval is required. Must meet general standards set by the Department.
- PHY 473 Physics Graduate Course I (Formerly PHY 433)** 2L:Arranged
Any physics course listed in the graduate calendar as a full course which is not also listed as an Arts and Science course. Departmental approval is required.
- PHY 474F Physics Graduate Course II (Formerly PHY 434F)** 2L:Arranged
Any physics course listed in the graduate calendar as a half course, given in the Fall Term, and not listed in the Arts and Science calendar. Departmental approval is required.
- PHY 475S Physics Graduate Course III (Formerly PHY 433S)** 2L:Arranged
Any physics course listed in the graduate calendar as a half course, given in the Spring Term, and not listed in the Arts and Science calendar. Departmental approval is required.
- PHY 476F Special Topics in Applied Physics (Formerly PHY 436)** Arranged
This course number is available to enable a student to take a fall term course within the Faculty of Applied Science and Engineering which complements his programme of study. Departmental approval is required.
- PHY 477S Special Topics in Applied Physics (Formerly PHY 436)** Arranged
This course number is available to enable a student to take a spring term course within the Faculty of Applied Science and Engineering which complements his programme of study. Departmental approval is required.
- PHY 478F Physics Seminar (Formerly PHY 437F)** Arranged
A group of students with common interests will, with the guidance of one or more staff members, prepare and present seminars. A minimum of six students is required in order for the course to be given. Approval is required.

POL**POLITICAL SCIENCE**

*Given by the staff of the Department of Political Economy
See also COM, ECO.*

*Supervisor of Studies:
Enquiries:*

Professor P. Silcox
Sidney Smith Hall, Room 3025 (928-3340)

The study of Political Science at the University of Toronto is wide-ranging and diverse, including such fields as political theory, Canadian government, international relations, and the detailed examination of political life and processes in numerous foreign societies (developed and developing). Students selecting courses in Political Science may be thinking of a career in public service; some may seek a more

profound understanding of political thought and political processes, perhaps for an eventual career in teaching; others may simply wish to know more about the world in which we live. The course offerings in the Department are designed to meet these needs; specialized courses (often with a number of prerequisites) for those who require detailed understanding of particular fields, less specialized (though no less rigorous) courses for those seeking a broad background in politics.

Courses in Political Science dovetail with programmes in most of the other disciplines of the social sciences and the humanities: Economics, Sociology, History, Philosophy, and Psychology. A student interested in Canadian studies or urban problems, for example, would be well advised to choose courses from all these disciplines, as would someone interested in international affairs or foreign area studies. A student planning graduate work in the social sciences should seek to obtain a basic understanding of each of these disciplines. Students who plan advanced work in Political Science are strongly urged to prepare themselves with a solid background in Political Theory and Statistical Methods, for these are the tools of the profession.

The Department publishes a handbook ("The Programme in Political Science") annually during the preregistration period. Copies can be picked up in the Department's Lounge, Room 3037, Sidney Smith Hall, or at the offices of College Registrars. Counsellors for students in each year are appointed annually by the Department and students are invited to consult them at any time during the session. A list of Counsellors is included in the handbook. The Political Economy Course Union, the students organization for Political Science undergraduates, has an office in Room 2034, Sidney Smith Hall.

Students taking the Specialist Programme in Political Science should enrol with the Department during September. Other students who intend to concentrate their studies in Political Science and who take three or more courses offered in the Department of Political Economy in 1973-74 (whether in Political Science or Economics) should enrol with the Department before November 1st.

RECOMMENDED INTRODUCTORY COURSES

- POL 100 Introduction to Canadian Politics** 2L VL1:TR11, UNIL:2:TR12, TL3:TR2, ½T:N
A study of the political process in Canada, including Canadian political culture, the formation of public opinion, political behaviour, political parties, the constitution, federalism, French Canada, federal-provincial financial relations, and the structure and functioning of political institutions, such as the cabinet, parliament, the judiciary, and the public service. *P. Fox, J.S. Dupré, J.E. Hodgetts, W.K. Bryden.*
Exclusion: POL 102
- POL 101 Introduction to Political Philosophy** 2L:TR1, 1T:N
The course is intended to introduce students to the most serious general theoretical statements about the nature of politics and the character of the just regime, the regime most appropriate for living the good life. It proceeds by careful study of some of the classic texts in the tradition and also hopes to give a training in how to read the great books dealing with political and moral problems. *A. Bloom.*
- POL 102 Introduction to Issues in Canadian Politics** 2L, 2T L1:TR2, T1:R4-6
For students who already possess some familiarity with Canadian political history and institutions. The course utilizes a thematic and problem-oriented approach to the political economy of Canada. Topics dealt with include: Issues in the Context of Ideologies (Democracy, Capitalism, Socialism, Marxism, Nationalism), Specific Issues: (the National Policy, Poverty, Pollution, Economic Nationalism, Health programmes, etc.), and Issues in the Context of Institutions (federalism, the party system, Parliamentary reform). Students entering the course should read in advance two of the following standard references: Fox, *Politics: Canada*, Dawson and Ward, *The Government of Canada*, Corry and Hodgetts, *Democratic Government and Politics*. Limited Enrolment. *J.T. McLeod.*
Exclusion: POL 100
Co-requisite: ECO 100

POL 103 The Politics of the Third World 2L, 1T:MWF2
 An introduction to the politics of Asia, Africa and Latin America. One part of the course will assess the different theoretical approaches to problems of change and development in the Third World; another part will analyze in some detail selected countries and assess their prospects for peaceful or revolutionary change. *J.S. Barker.*

POL 104 Foreign Political Institutions 2L:TR10, 1T:N
 A contemporary course stressing foreign political movements and forms of government relevant to twentieth century politics: Presidential government (U.S.); Parliamentary systems (France and Germany); Soviet Communism; and the fascism of Mussolini's Italy and Nazi Germany. *J.E. Smith.*

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

POL 200 Political Theory 2L:TR10, 1T:N
 The development of political thought from Thucydides to the controversies surrounding the French revolution. Among the theorists examined are Aristotle, Machiavelli, Hobbes, Locke and Rousseau. *G. Heiman, C.B. Macpherson.*

POL 201 Political Behaviour 2L:TR2
 An introduction to the social and psychological study of politics. Among the topics considered are political élites and political power, class and ethnic conflict, the powers and nature of political ideologies (liberal and conservative, radical and reactionary), political socialization and political estrangement, violence and political extremism. *J.C. Terry.*

POL 202 Political Economy and Public Policy 2L:T4-6
 A course in elementary economics would be a useful prerequisite to this course, but is not crucial if the student undertakes to catch up on his own. This course is concerned with current public policy problems where economic and political factors interact. Major emphasis will be placed on the Canadian-American relationship with particular regard to the role of the multi-national corporation as an instrument of inter-governmental pressure and mechanism linking economic and political forces. *S.H.E. Clarkson.*
Prerequisite: None (but ECO 100 is strongly recommended).

POL 203 Politics and Government of the United States 2L, 1T:MWF9
 During the first term, this course concentrates on the evolution of the American constitution with particular reference to individual rights, federalism and governmental powers. In the second term, the course deals with the actual operation of government through the workings of politics and administration; it covers executive-legislative relations, parties, pressure groups, the bureaucracy, and foreign affairs. *R.A. Manzer.*

NOTE: The following courses are also open to First-Year students at the discretion of the instructor if space is available and pre- and co-requisites are satisfied.

POL 204 Politics and Government of the U.S.S.R. 2L:TR11, 1T:N
 An introduction to the domestic politics and foreign relations of the U.S.S.R., with emphasis on the post-Stalin era. The initial phase will be taken up with the political history, political culture, and institutions of the U.S.S.R., and with a consideration of alternate approaches to the study of Soviet politics. Detailed attention will then be given to the Soviet policy process in both domestic and external affairs. Although the stress will be on internal politics, roughly a quarter of the course will be devoted to external affairs and the impact of external events and foreign policy considerations on the Soviet domestic scene will be emphasized throughout.

- POL 205 Politics of Britain and the Commonwealth** 2L:TR2, 1T:N
 The first term is devoted to government in the United Kingdom, the second to dominions such as Australia and New Zealand. This comparative course in British parliamentary ideas and institutions examines how these have been modified by geography, history, economics, and temperament. Emphasis is placed on problems of federalism, party politics, social security, and race relations. *E. Wallace*
Prerequisite: POL 100/102
- POL 206 Government and Politics in Africa** 2L:TR12
 An introduction to government and politics in tropical Africa. The focus of the first half of this course will be upon the major factors shaping political development in the newly independent African states south of the Sahara. In the second term the focus will be upon the government and policies of several prominent African states. *J.S. Barker, R.C. Pratt.*
- POL 208 Introduction to International Relations** 2L:M4-6
 An examination of the sources, patterns, and limitation of interstate conflict. Philosophical approaches to international politics, theories of imperialism, distinctive international systems in history, and international organization and law are among the topics covered in this course. *B. Kovrig.*
- POL 209 Public Policies in Canada** 3L:MWF11
 The growth of public policies for national development, defence, social welfare and human rights is considered in a comparative perspective, and the contribution of the instruments of government towards the satisfaction of basic human needs for welfare, security, fraternity, equality and liberty is assessed. *R.A. Manzer.*
Prerequisite: POL 100/102
- POL 210 Science, Technology and Public Policy** 2L:W4-6
 This course examines the social impact of advances in science and technology and governmental efforts to frame and implement "science policy". Among topics examined are: the social responsibilities of scientists and engineers, the prospects for democracy in view of the need for technological expertise, and controversial policy issues involving scientific considerations. *P. Soloman*

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

NOTE: The following courses are also open to Second-Year students at the discretion of the instructor if space is available and pre- and co-requisites are satisfied.

- POL 300 Topics in Comparative Politics** 2L:TR9, ½T:N
 After a brief analysis of the various approaches which are currently being used for comparative political analysis and the various attempts which are being made to classify political systems, the course will focus on certain selected topics of comparative politics. These topics will include political culture, ideology, political elites, mass political socialization, and the decision-making process. Illustrative material will be drawn from the experience of a number of countries, including the Soviet Union, Canada, Great Britain, and the United States. *D.V. Schwartz.*
- JMC 300 Modern China in Revolution**
 (See JMC under "Joint Courses")
- POL 302 Politics and Government of Western Europe** (Not offered 1973-74)2L
 An advanced course in comparative government: Germany (East and West), France, Italy and the Iberian peninsula; as well as problems of European integration, the Common Market and Europe's role in the world community.

- POL 305S Politics and Government of Latin America** 2L:N
 This course aims to describe political power as a structural and dynamic component of the Latin American Societies. The colonial heritage and its influence on the shaping of the new power structures will be considered. But the core of the course is the most important political realities of the present, such as the failure of the nation-states to develop as integrated and autonomous power structures, the consolidation of dependent capitalism and the political order inherent in it, the co-existence of contrasting types of domination ("traditional" and "rational") in the organization of the political systems, the rigid monopolization and the flexible use of the state by the ruling sectors, the general frustration of national revolution under bourgeois hegemony, its impact on the radicalization of nationalism and the emergence of the socialist alternative through the Cuban revolution.
Prerequisite: POL 103
- POL 306 Soviet Foreign Policy** 2L:TR2
 Foreign political and military relationships of the U.S.S.R. from 1917 to the present, with emphasis on the post war period. Issues to be considered include: policy formation and the role of ideology; the nuclear arms race; conflict with China; relations with Eastern and Western Europe; the use of Communist movements; and policy toward Canada.
F. Griffiths.
- POL 307 Psychological Theories of Politics** 2S:M4-6
 Among the theorists to be examined are Freud, Reich, Fromm, Marcuse, Erikson, Maslow, Skinner, Laing, Esterson, Binswanger, Lasswell, Adorno and Lane: psycho-analytic existential and behaviourist approaches and their applications to politics.
Prerequisite: One course in political theory
- POL 308 Urban Politics** 2L:TR10, ½T:N
 This is a comparative course dealing with Urban Politics in Canada, Britain and the United States. It will deal with governmental structure, political issues, and the political process in urban areas. A major element of the course will be a research paper on some aspect of politics in the metropolitan Toronto area. Students are encouraged to read H. Kaplan, *Regional City* and E. C. Banfield & J.Q. Wilson, *City Politics* as an introduction to the course. Limited enrolment. *P. Silcox.*
- POL 310 Comparative Public Law: Canada and the United States** 2L:TR11, 2T:R4-6
 A comparison of the public law of Canada and of the United States, beginning in each case with its basis in theory and with emphasis on the role of the judiciary in each country in its development. Topics to be considered include federalism, civil rights, administrative law, criminal procedure, etc. *W.F. Berns, P.H. Russell.*
- POL 311 Canadian Political Parties** 2L:T4-6
 A course on the role and functioning of political parties in the contemporary Canadian political system. After some consideration of theoretical approaches, study and discussion will focus on the following main subject areas: intra-party structures and processes; public opinion, elections and voting; party systems, federal and provincial; party philosophies and programmes.
- POL 312 Canadian Foreign Policy** 2L:TR1
- POL 313 The Politics of International Migration** 2L:F9-11
 An examination of the role of government in international migration and of the immigration policies of selected countries including Canada, the United States, Great Britain, Australia and Israel. *F. Hawkins.*

- POL 314 **Public Opinion and Voting** 2L:TR12
 This course examines the influence of social, psychological and cultural factors in the individual's decision to vote for a particular candidate or political party. The course also explores the processes of opinion formation and the link between opinions and the voting decision. The emphasis is on material from Canadian Politics but studies in other countries will be used for comparison. *J. Terry.*
- POL 315 **Nationalism and Separatism** 2S:W4-6
 A comparative examination of nationalist ideologies, attitudes, and political movements with special attention to the separatist movement in Quebec. *H.D. Forbes*
Prerequisite: POL 100/102 is recommended.
- POL 316F **Canadian Federalism** 2L:W9-11
 An examination of contemporary Canadian federalism with particular emphasis on the structural, administrative and financial aspects of federal-provincial relations and on the requirements of cultural dualism. This will be illustrated by a study of specific cases of policy development. *F. Hawkins*
Prerequisite: POL 100/102
- POL 317S **Ontario Government and Politics** 2L:W9-11
 A study of political structures and processes in Ontario with particular reference to: Cabinet government and the interaction of Cabinet, Legislature and Public Service; political parties and the party system; provincial-municipal relations. *K. Bryden*
Prerequisite: POL 100/102
- POL 320 **Modern Political Thought** 2L:TR3, ½T:N
 This course examines the development of political thought in the period beginning after the French Revolution and continuing through the nineteenth century, with special attention to the implications of this development for political thought in the twentieth century. Both democratic and anti-democratic tendencies are considered. *C. Bay, C.B. Macpherson*
Prerequisite: POL 101/200
- POL 322 **Introduction to Public Administration** 2L:TR12
 This course is intended to introduce students to the literature of public administration and to some of the main issues of the present and recent past in Canada (and to a limited extent in Britain and other countries). In other countries primary emphasis will be on policies or features that have influenced Canadian practice. *W.E. Grasham.*
Exclusion: COM 301
Prerequisite: POL 100/102
- POL 323 **Workshop in Canadian Government** 2L:R9-11
 Enrolment is restricted to 10 persons.
Prerequisite: POL 100/102
- POL 324 **Politics and Governments of Eastern Europe** 3L:MWF2
 A comparative analysis of eight Communist states—Albania, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Rumania, and Yugoslavia, *H.G. Skilling.*
Prerequisite: POL 204
- POL 327 **Comparative Foreign Policy** 2S:Eve.
 The course examines, on a comparative basis, the foreign policies of the United States, the Soviet Union, Great Britain, France, Germany and India. *R. Gregor.*

- POL 328 **International Organization** 2S:R4-6
 A weekly two-hour research seminar concerned with the development, structures, and functions of international organizations. The emphasis is on the political impact of international organization in international relations. Most attention will be focused on the two universal, political organizations, the United Nations and its forerunner, the League of Nations. Other international organizations will also be considered. *J. Barros.*
- POL 329 **Marxism** 2L:N
 A study of the major texts of Marx and Engels and secondarily those of Lenin and Mao. Greater emphasis will be placed on the philosophy of Marxism and the general problems of its practical application than on the history of the communist movement in particular countries. *E. Andrew.*
Prerequisite: POL 200
- POL 330 **Politics and Morality** 2L:M4-6, 2T:W46-
 A study of the relation between the individual's quest for the good life and the political order concentrating particularly on the role of the wise man in civil society. The course proceeds by way of careful study of a small number of texts including Aristophanes, Plato, Rousseau, and Nietzsche. *A. Bloom.*
- POL 331 **Politics in French Canada** 2S:M4-6
Prerequisite: POL 100/102 and a reading knowledge of French.
- JHP 343 **Introduction to South African History and Politics**
 (See JHP under "Joint Courses")

COURSES OPEN TO FOURTH-YEAR STUDENTS

- POL 400 **Twentieth Century Political Thought** (Not offered 1973-74) 2S
- JEP 400 **Politics and Economic Development**
 (See JEP under "Joint Courses").
- JMC 400 **Nationalism and Social Change in Contemporary China**
 (See JMC under "Joint Courses")
- POL 401 **Ancient and Mediaeval Political Thought** 2S:M4-6
 An advanced study of such works as Plato, *Laws*; Aristotle, *Nicomachean Ethics*; Cicero, *On the Commonwealth*, and selected writings of St. Augustine, St. Thomas Aquinas and Marsilius of Padua. In addition there will be analysis of such concepts as the city state, natural law and the relationship between church and state in the Middle Ages. Students must obtain the instructor's permission before enrolling in this course.
Prerequisite: POL 200
- POL 403 **The Marxian Revolutionary Model: China** (Not offered 1973-74) 2S
 This course will deal with selected aspects of the Marxian revolutionary model. Marx's views on classes, nationalism, peasants, and class consciousness and the party will be discussed, followed by the innovations of Lenin, Trotsky, Lukacs and Mao Tsetung. The second half of the course will focus on the development of the revolutionary situation in China after 1911. *R.A. Fenn.*
Prerequisite: POL 200/320/329/204/324/JMC 300/PHL 311S.
- POL 405 **The Judicial Process: Canada in a Comparative Context** 2S:W9-11
 Primarily concerned with the nature of judicial power and alternative judicial structures. It focuses on the Canadian judicial system but compares that system with those of other societies including U.K., U.S.A., Africa and U.S.S.R. *P.H. Russell.*

- POL 407 **Politics in Toronto** (Not offered 1973-74) 2S
 An examination of the political system of Metropolitan Toronto, particularly as it relates to the question of development and low income housing. The course will pay relatively little attention to the details of administrative structure, but will focus on the theoretical issue of the structure of power and influence in urban decision-making.
- POL 408F **Public Administration: Organization Theory** 2L:W4-6
- POL 409S **Public Administration: Policy Development** 2L:W4-6
- POL 410 **The State and Economic Life** 2S:T4-6
 The development of the welfare state in the English-speaking world in the 20th Century. Emphasis is placed on the theory and practice of state regulation of industries and national economies. Consideration is given to the political implications of modern economic philosophy in the writings of K. Polanyi, Schumpeter, Keynes, Hayek, Galbraith, Friedman, Crosland, and others. *J.T. McLeod.*
- POL 412 **The Canadian Political System** 2S:R9-11
 This course focuses on the making of public policy and the political process in Canada. It includes an analysis of pressure groups, parties, public opinion, electoral behaviour, mass media, duality of Canadian culture, regionalism, and the federal system. Limited enrolment. *F.W. Peers.*
- POL 413 **Provincial and Local Government** 2S:M4-6
 This course is an inquiry into the extent to which provincial and local governments in Canada are conducive to such basic political values as liberty, participation, and efficiency. It deals primarily with questions of structure, processes and policy, and focuses upon the provincial and local experience with such adaptive mechanisms as cabinet and departmental reform, political and administrative centralization and decentralization, and regional government. Due attention will be given to adaptive strategies as well as mechanisms. *M. Brownstone, J.S. Dupré*
- POL 414 **Comparative Communism** 2L:W4-6
 Theoretical problems of comparative analysis and empirical case studies of individual Communist systems. *H.G. Skilling.*
Prerequisite: Permission of the Instructor.
- POL 415 **International Politics** 2L:W4-6
 A seminar concerned with choice of action by governments and individuals seeking to deal with the problem of war and the political and economic costs of being prepared for it. The first term will be taken up with balance of power, collective security, peacekeeping, arms control, deterrence and other guides to action such as peace research, pacifism, and anti-imperialism. In the second term the seminar will turn to case studies of national and international security policy-making and to the consideration of effective forms of citizen response. *F. Griffiths.*
Prerequisite: Permission of the instructor
- POL 416 **Problems of International Law and Relations** (Not offered 1973-74) 2L
 This course is designed to serve both as an introduction to international law and as an opportunity for student research on legal and non-legal aspects of current international problems. Most of the first term will be devoted to lectures and class discussion in these areas: nature, basis and origins of international law; recognition theory and practice; nature and extent of state authority (jurisdiction); diplomatic and consular functions and privileges; treaty-making and the law of treaties. The rest of the year will be spent on the presentation and discussion of student research topics accepted as suitable for satisfying the course requirement of a major paper.

- POL 417 **The Third World in International Politics** (Not offered 1973-74) 2L
This course is designed to bridge the gap existing between comparative politics of developing countries and traditional international relations. It focuses on the newly independent countries of Africa, Asia, Latin America and the Middle East; their impact on the international system, and the external and internal factors that influence their international behaviour.
- POL 418 **Workshop in Political Science** (Not offered 1973-74) 2S
- POL 419 **Topics in Canadian Foreign Policy** 2S:N
Prerequisite: Permission of the Instructor
- POL 420 **Elements of U.S. Foreign Policy** 2S:T4-6
An examination of the constitutional framework and decision-making aspects of American foreign policy with pertinent case-studies. *J.E. Smith and B. Kovrig.*
Prerequisite: Permission of the instructors
- POL 421 **Topics in Political Thought** 2S:F2-4
Limited enrolment. *A. Bloom.*
- POL 422 **Topics in Soviet Politics** 2S:T4-6
The focus of this course will be the decision-making process in the Soviet political system. The seminar will involve an analysis of some of the factors which affect the decision-making process in the Soviet political system: institutions, ideology, the nature of the leadership, non-political elites, social structure, the external environment, and administration. *D.V. Schwartz.*
- POL 423 **The Political Economy of Health in Canada** 2S:T9-11
A seminar course concentrating on policy and public administration problems relating to health services. Topics dealt with include: the development of health legislation in Canada with particular reference to hospital insurance and medical insurance, the economics of the health sector, the structure of the Ontario Department of Health, pressure group activity and influence, professional bodies as "private governments", regulatory and licensing problems, issues involved in "group practice" and in the doctors' strikes in Saskatchewan in 1962 and Quebec in 1970. *J.T. McLeod, C. Hughes.*
- POL 424 **Problems in Political Inquiry** 2S:R9-11
Topics will include: the analogy between natural sciences and political science; the relation between theory and research in political science; to what extent is progress in political science cumulative; fact and value in political inquiry; explanation and prediction in political science. One body of theory and research, e.g. Democracy or Political Development, will be selected as a case study of these problems. *S.G. Solomon.*
Prerequisite: POL 200/201/320 or permission of instructor
- POL 427 **Soviet and East European Marxism** 2S:R4-6
This course will examine the successive attempts to operationalize Marxist-Leninist theory, the practical difficulties involved and the resultant alterations in the theory itself. *R. Day.*
Prerequisite: Permission of Instructor
- POL 429 **Quantitative Methods and Research Design** 2S:M9-11, 1P:N
An introduction to quantitative methods. The essentials of statistical description and inference are presented in the context of survey research on political behaviour. General principles of measurement and explanation are discussed in terms of specific problems in the analysis of survey data. *H.D. Forbes*

- POL 430 Topics in African Government** 2S:T4-6
The course will concentrate on two themes: (a) the nature and role of the state in post-colonial tropical Africa and (b) policies and problems of rural development in tropical Africa. The analysis will centre on a limited number of countries (Ghana, Senegal, Tanzania—for example), each of which will be studied in depth and in relation to the relevant theoretical literature.
- POL 431 The Government and Politics of South Asia** 2S:W4-6
An examination of political culture, institutions, and political behaviour in South Asia. Countries considered include Bangladesh, Ceylon, and Pakistan but the emphasis of the course will be on India. *A. Rubinoff.*
- POL 432 Problems of Supranational Integration** 2S:F9-11
Concepts and theories of political integration, examined with evidence from historical case studies and from current integration efforts in Western and Eastern Europe, the North Atlantic area, and other regions among developing countries in Latin America, Asia, and Africa. The second term will be devoted entirely to a study of the economic and political factors, both internal and external, affecting the course of West European integration. An analysis will be made of the present state of the process, and the internal and external consequences of alternative outcomes. *G. Friesen.*
- POL 433 Topics in United States Government and Politics** 2S:W4-6
A study of the theory and practice of liberal democracy in the United States. *W.F. Berns.*
Prerequisite: POL 203 and permission of the Instructor
- POL 440 Thesis** Arranged
- POL 441 Reading Course in an Approved Subject** Arranged
Open only when a faculty member is willing and available to supervise. Students must obtain the approval of the supervisor of Undergraduate Studies, before enrolling in this course.

POLISH - See SLA under "Slavic Languages and Literatures"

PRT

PORTUGUESE

Given by the staff of the Department of Hispanic Studies

<i>Chairman of Department:</i>	Professor G.L. Stagg
<i>Undergraduate Secretary:</i>	Professor M.E. Rugg
<i>Enquiries:</i>	21 Sussex Avenue, Room 224 (928-3357)

Portuguese, the language of Portugal and of Brazil, is spoken by more than one hundred million people on four continents: Europe, Africa, Asia and America. Twenty percent of all residents of the Western Hemisphere are Brazilians, who attest to the truth that one out of every five Americans—North, Central, South—speaks Portuguese as his native language.

Portugal's literature began on a high note in the twelfth century, and her discoveries in the Renaissance led her to all corners of the globe. In the last two decades Portugal has given to Canada many thousands of new citizens, and Brazil is attracting the attention of Canadians through her vast potential as a land of culture, of natural resources, and of industry.

It is with Brazil that the Portuguese studies at the University of Toronto are particularly concerned, although the outstanding European heritage is by no means forgotten. Through small classroom and language laboratory groups, the introductory course (PRT 100) provides basic instruction in grammar, conversation, reading and writing. A second course (PRT 200), Intermediate Portuguese, is intended for students with a knowledge of the language. A third course (PRT 220) is an introduction

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- PSL 321 **Elementary Human Physiology** 2L:TR3
 An elementary lecture course in the principles of human physiology. Not recommended for students intending to specialize in Physiology.
Exclusion: PSL 322
Prerequisite: BIO 100/110/120
- PSL 322 **Human Physiology** 3L:MWF2
 A lecture course covering the field of human physiology, including blood, circulation and respiration, digestion, endocrine glands, nerve and muscle, central nervous system and special senses. Intended for students planning to take further courses in Physiology.
Prerequisite: ANA 200/ZOO(250 & 251), BIO 100/110/120, CHM 235/240/241, MAT 130/135/139/150, PHY 130/131/120
Co-requisite: BCH 321/320
- PSL 373Y **Human Physiology Laboratory** 4P:N
 Laboratory to accompany PSL 322.
Co-requisite: PSL 322

COURSES OPEN TO FOURTH-YEAR STUDENTS

- PSL 424 **Endocrinology** 2L:TR11
 The functions of endocrine glands and their regulation.
Prerequisite: PSL 322 & BCH 321/320
Co-requisite: PSL 322/BCH 321/320 (if not taken as prerequisite)
- PSL 427F **Electrophysiology** 2L:TR12
 An advanced course in electrophysiology.
Prerequisite: PSL 322 (MAT 230/235 recommended)
- PSL 428 **Tracer Methodology** (Not offered 1973-74) 2S
 A reading and seminar course in tracer methodology. Enrolment restricted to a few students judged by Department to have requisite background.
- PSL 430 **Mathematical Aspects of Physiology** (Not offered 1973-74) 2S
 A course for students in biological science covering certain areas of mathematics (excluding statistics) useful in physiology, biophysics and medicine. Subjects taught include solution of ordinary and partial differential equations, linear systems analysis, programming of digital and analogue computers, aspects of linear algebra, vector calculus and numerical analysis. Examples of the applications of mathematics in physiology are discussed. (Offered in alternate years.)
Prerequisite: MAT 130/135/139/150 (BIO 100/110/120 recommended)
- PSL 431S **Turnover and Transport in Physiological Systems** 2S:N
 Mathematical development of the essential concepts employed in the study of the kinetics of metabolites within intact physiological systems. The use of metabolic tracers in kinetic studies both in compartmentalized and non-compartmentalized systems is discussed. The mathematical development of the principal equations used in indicator-dilution studies of blood flow and blood volume is given. (Offered in alternate years.)
Prerequisite: Permission of the department
- PSL 498 **Project in Physiology** N
Prerequisite: PSL 322 & 373Y
Co-requisite: PSL 322 & 373Y

Given by the Members of the School of Hygiene

Acting Head of the Department:

Professor R.S. Freeman

Enquiries:

School of Hygiene, 150 College St., Room 117
(928-2759)

Parasitology is the biological science that deals with animals which live on or in other animals, the hosts. The study of parasitism seeks to understand the form, function, reproduction, ecology, and evolution of parasites, and the nature of the delicate balance between parasite and host that allows the two to live as a biological unit. Although some parasitic associations result in disease, most in their natural state do not. For this reason the subject is of interest to biological as well as medical disciplines. Most parasites occur among the protozoa, various groups of worms, and the arthropods. The latter, which includes insects and their relatives, are considered, not only because some are direct parasites, but because other arthropods transmit parasites to man and animals. Parasitologists utilize the tools and knowledge of numerous disciplines including ecology, physiology, immunology, pathology, pharmacology, taxonomy, microbiology, and biometrics to mention some of the more important ones. Furthermore, to be effective, parasitologists require detailed knowledge concerning the hosts, often both vertebrates and invertebrates. Parasitologists may have careers in universities, colleges, or museums with emphasis on teaching and research, in human or veterinary medicine, in government agencies, such as departments of public health, environment and agriculture, in fisheries and wildlife management, or overseas with various agencies. The study of parasitism is not only fascinating and rewarding in its own right, but it may provide answers leading to control of some of the major ills of mankind.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- JPZ 252 **Parasites and Parasitism**
(See JPZ under "Joint Courses")

COURSES OPEN TO FOURTH-YEAR STUDENTS

- PST 403S **Fine Structure and Physiology of Parasites** 2L:TR11, 3P:R2-5
The cytology and physiology of parasitic helminths and protozoa. Literature covering topics such as developmental patterns, locomotion, reproduction and osmotic regulation—excretion will be reviewed. Students will undertake problems in electron microscopy.
K.A. Wright and D.F. Mettrick.
Prerequisite: JPZ 252
- PST 407 **Arthropods as Parasites and Vectors** 2L:W2-4, 3P:T2-5
Behaviour, ecology and functional morphology as stressed. *S.B. McIver.*
Prerequisite: BIO 100/110/120
- PST 409 **Helminthology** 2L:N 3P:W2-5
The form and function of parasitic worms, their place in the animal kingdom and their movement through various ecosystems are considered. *R.S. Freeman, K.A. Wright.*
Prerequisite: JPZ 252
- JPZ 443F **Physiology of Symbiotic and Parasitic Organisms**
(See JPZ under "Joint Courses")

<i>Chairman of Department:</i>	Professor G.E. Macdonald
<i>Undergraduate Secretary:</i>	Professor K.E. Patterson
<i>Enquiries:</i>	Sidney Smith Hall, Room 4044 (928-3407)

Psychology is that branch of science which seeks to understand the behaviour of organisms. Psychology accepts the individual organism rather than the collective or group as the unit of analysis. The courses in this Department are designed to acquaint students with the fundamental principles of Psychology, its research findings and methodologies. Experimentation, laboratory work, and the use of statistical methods in assessing data are fundamental tools of the psychologist. Applied Psychology is not a part of the undergraduate curriculum in Arts and Science.

Students who are interested in Psychology as a career must be prepared for three to five years of graduate study. Persons who hold a Ph.D. in Psychology find employment in universities, research institutes, and large corporations, or may be self-employed consultants. The B.Sc. with concentration in Psychology is not a professional qualification. A student who has included a large amount of laboratory work in his programme may find employment as a research technician in a university or research institute laboratory, or he may be employed in a technical assistant capacity in business or industry, particularly if he combines laboratory skills with a knowledge of computer techniques. The B.Sc. may also lead into programmes of study in The Faculty of Education. Undergraduate courses in Psychology may be of value to students planning various professional careers, such as in medicine, engineering, law, nursing, physical education, etc. In all cases, however, the graduate with a B.Sc. must expect on-the-job training, graduate study, or both.

The staff of the Department represents a highly diversified interest which is reflected in the number and variety of undergraduate course offerings. A more detailed description of the content and character of courses, as well as the name of the instructor(s) may be found in a booklet issued by the Department obtainable from Room 4044, Sidney Smith Hall. Students entering Second and higher years in particular are advised to consult this booklet before selecting courses, and to discuss their proposed programme with the Student Inquiry Officer (Mrs. Dart) and/or a member of the professorial staff.

The New Programme allows each student to determine his own degree of specialization between or within disciplines. In Psychology it is possible to plan a diversified programme of courses at the 200-level which serve to delineate the main lines of current research and its historical antecedents in various areas e.g. learning, motivation, perception, personality, cognition, and physiological, abnormal, social, and developmental psychology. At the other extreme, it is possible to pursue in some depth a limited number of topics by selecting two to four appropriate half-courses at the 200-level which lead into continuation courses at the 300- and/or 400-level. Most students will probably wish to plan a programme somewhere between these two extremes.

It is important to note that 200-level courses may quite appropriately be included in the programme of a third- or fourth-year student. This designation merely indicates that the course does not demand preparation beyond the introductory course. Courses with 300- and 400-level designations are intended for the student who wishes to build upon the material covered in 200-level courses—they are therefore not available until the student has reached his third or fourth year of study, respectively.

Some courses offered by this Department are under considerable enrolment pressure. When the number of students applying for a course exceeds that which can be handled by the available staff and threatens the maintenance of academic standards, it will be necessary to deny admission to some students. In the case of students entering second year who wish to take one or more 200-level PSY course, a *departmental* pre-registration form (available in Room 4044, Sidney Smith Hall) must be filled out and returned to the Department (Room 4044, Sidney Smith Hall) before the end of pre-registration. In the case of students entering third and fourth year who wish to take one or more 300- or 400-series PSY course, Departmental pre-registration forms must be filled out and returned to the Department in advance of Faculty pre-registration. Lists of students accepted into these courses will be posted in advance of Faculty pre-registration. A full statement of enrolment limitations and the method by which students will be selected for those courses which are oversubscribed can be found in the Departmental booklet.

Any student with the stated prerequisites may apply for admission to any course. A student who lacks the prerequisite as stated, but who believes that he has the necessary background for a higher-

level course should write a statement describing the nature of this preparation and submit the information to the Department. A student who is able to demonstrate the adequacy of his preparation will be considered on the same terms as those who have the formal prerequisites.

The criteria for admission of students to courses are posted in the Department and are published in the Departmental booklet. In certain cases, grades in prior courses will be considered.

Students who are refused admission to a course at pre-registration may file a written appeal with the Undergraduate Secretary at that time. During registration period in the fall, additional places in courses are often available, and students interested in entering these courses should make application with the Department at that time.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- PSY 100** **Introductory Psychology** 3L:N, 1T:N
 The course is designed to familiarize students with important concepts in various areas of contemporary Psychology. The ways in which psychologists formulate questions and attempt to answer them will receive particular emphasis. This course or PSY 105 is prerequisite for 200-level courses in Psychology.
Exclusion: PSY 105
- PSY 105** **Historical Orientation to Psychology** 3L:MWF3
 An introduction to Psychology with historical orientation. While intended primarily for students who wish to obtain some understanding of Psychology as a discipline as part of their general education, and not intending to concentrate, this course fulfils the prerequisite requirement for 200-level courses.
Exclusion: PSY 100

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- PSY 202F/S** **Introduction to Development** 3L:MWF12
 The developmental approach to the study of behaviour with reference to sensori-motor skills, cognition, socialization, personality, and emotional behaviour.
Exclusion: PSY 200/202 in 1968-69 or before; PSY 301F/S in 1969-70 or 1970-71
Prerequisite: PSY 100/105
- PSY 203F/S** **Introduction to Social Psychology** 3L:MWF2
 A survey of contemporary areas of research in social psychology. Areas to be considered include social perception, attitudes, interpersonal relations, group processes, and ethnic attitudes.
Prerequisite: PSY 100/105
- PSY 204F/S** **Introduction to Personality** 3L:MWF11
 A survey of theory and research in personality.
Prerequisite: PSY 100/105
- PSY 211S** **Viewpoints in Motivation** 3L:M7-10p.m.
 Examination of concepts and approaches in motivation from an historical perspective.
Prerequisite: PSY 100/105
- PSY 220F/S** **Conditioning and Behavioural Control I** 3L:MWF10
 This course provides a detailed examination of classical and operant conditioning and the use of conditioning in the control and manipulation of behaviour. Topics covered include reinforcement, reinforcement contingencies, extinction, stimulus control (i.e. discrimination, generalization), and the aversive control of behaviour (i.e. punishment, avoidance, etc.).
Exclusion: PSY 206F
Prerequisite: PSY 100/105

- PSY 221F/S **Introduction to Abnormal Psychology** 3L:MWF9
 A survey of theories and research in psycho-pathology and psycho-therapy.
Exclusion: PSY 330F/S
Prerequisite: PSY 100/105
- PSY 222F **Thinking and Reasoning** 2L:WF1, 1T:N
 This course surveys the efforts of psychologists, educators, and others to understand man's ability to think and reason. Areas to be covered include: deductive reasoning, inductive reasoning, problem solving, computer simulation models, game playing, and productive thinking.
Prerequisite: PSY 100/105
- PSY 223F **Perception** 2L, 1P:MWF10
 The identifying and localizing of objects and events in the environment; the perceiver as a seeker and user of information in the stimulus array; perceptual constancies, perception of space, movement, and form. Demonstration and experiments.
Exclusion: PSY 314S in 1969-70 or 1970-71
Prerequisite: PSY 100/105
- PSY 224F **Psychology of Language** 2L:WF11, 1T:N
 An examination of modern psychological and linguistic theories of language behaviour and of experiments and observational studies based on these theories.
Exclusion: PSY 305F in 1970-71
Prerequisite: PSY 100/105 or JAL 100
- PSY 225F **Human Memory and Learning, I** 3L:MWF2
 This course is the first part of a sequence of two half-courses at the 200-level. PSY 225F will emphasize human memory and information processing. The material covered will include consideration of methodology and techniques, basic empirical phenomena, and theoretical approaches to memory and learning.
Exclusion: PSY 207F/S
Prerequisite: PSY 100/105
- PSY 226S **Human Memory and Learning, II** 3L:R7-10p.m.
 This course is the second part of the sequence of two half-courses at the 200-level. PSY 226S will emphasize verbal learning. The general orientation of the course will be experimental-theoretical although some consideration will be given to applied areas such as programmed instruction.
Prerequisite: PSY 225F
- PSY 230F **Interpretation and Evaluation of Psychological Data** 3L:M7-10p.m.
 The nature and description of psychological evidence; the interpretation of inferential statistics; the scientific literature in psychology. Students planning a professional career and/or graduate work in psychology are advised to take STA 222/232/252 rather than this course. However, this course will satisfy prerequisite requirements for all 300-level courses except PSY 307S, 315F, 320, 321, 322, 323, 329S, 350, 351.
Exclusion: PSY 201S, STA 222/232/242/252, ECO 220, GGR 270, GLG 221Y, SOC 201.
Prerequisite: PSY 100/105
- PSY 240S **General Experimental Psychology** 1L, 2P:M7-10p.m.
 A laboratory course, following PSY 230F, intended for the student who wishes to become more familiar with problems and methods in data collection. Demonstrations and experiments from a variety of areas in experimental psychology. (Students planning a professional career and/or graduate work in Psychology should take one or more of PSY 320, 321, 322, 323, 350 and 351 rather than this course.)
Exclusion: PSY 210 (1968-69) PSY 334 (1968-69 or 1969-70)
Prerequisite: PSY 230F/PSY (200F & 201S)/STA 222/232/242/252

- PSY 243S Methods in Perception** 2L, 1P:W7-10p.m.
 General methodological problems in the study of perception and sensory processes; the description of stimuli; some basic sensory processes such as detection and discrimination. Demonstrations and experiments.
Exclusions: PSY 208S in 1969-70 or 1970-71
Prerequisite: PSY 223F
- PSY 250 Animal Behaviour and Neuropsychology** 2L, 3P L1:TR4, P1:T9-12, P2:R9-12, P3:T7-10p.m.
 An analysis of behaviour from a biological point of view. Basic principles of ethology, neurophysiology and neuroanatomy will be presented and applied to various topics including organization of responses, perceptual mechanisms, motivation variables, interaction among behavioural systems, memory and learning. Laboratory work will involve exercises and demonstrations on the foregoing topics.
Exclusion: ZOO 222/PSY 209F/241S/242S
Prerequisite: PSY 100/BIO 100/110/120

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- PSY 300S Developmental Psychology: Comparative Development** 3L:W7-10p.m.
 An examination of the development of psychological processes in the individual. The processes included in this survey will include learning, motivation, emotion, attachment and socialization and the acquisition of language. The emphasis will be on the psychological processes rather than on the species being studied. Offered in alternate years.
Prerequisite: PSY 206F/220S/ZOO 222 and PSY 230F/STA 222/232/242/252. (In 1975-76 the prerequisites will be PSY 250/ZOO 222 and PSY 230F/STA 222/232/252).
- PSY 301S Developmental Psychology: Cognitive and Sensory Development** 3L:R4-7p.m.
 Learning, problem-solving, thinking, concept formation, with strong accent on Piaget's theory of cognitive development throughout the age span.
Exclusion: PSY 200 or 202 in 1968-69 or before
Prerequisite: PSY 230F/STA 222/232/252 and PSY 202F and PSY 206F/S/207F/S/220F/S/225F
- PSY 302S Social Psychology: Attitudes** 3L:MWF3
 Intensive study of social attitudes and opinions—their development, description and measurement, modification, and organization.
Exclusion: PSY 304F/S or PSY 306S
Prerequisite: PSY 230F/STA 222/232/252 and PSY 203F/S and two additional PSY half-courses at the 200-level.
- PSY 304F Social Psychology: Inter-personal Behaviour** 3L:T2-4, F1
 Detailed analysis of some of the determinants and consequences of various forms of social interaction; conformity and social influence, social comparison, affiliation.
Exclusion: PSY 302S or PSY 306S
Prerequisite: PSY 203F and PSY 230F/STA 222/232/252 and two additional PSY half-courses at the 200-level
- PSY 306S Social Psychology: The Individual and the Social System** 3L:T2-4, F1
 Detailed examination of psychological consequences of social structure: social norms, social roles, stratification, groups and organizations.
Exclusion: PSY 302S or PSY 304F/S
Prerequisite: PSY 230F/STA 222/232/252 and PSY 203F/S and two additional PSY half-courses at the 200-level

- PSY 307F Personality Assessment** 3L:MWF2
 Analysis of concepts and methods for the measurement of personality, including statistical analysis of reliability and validity; norms, observational methods, structured tests, interview, projective techniques, nonreactive measures. Ethical problems in assessment. NOT a course in test administration.
Prerequisite: PSY 201S/STA 222/232/252 and PSY 204F/S
- PSY 309F Organization and Memory** (Not offered 1973-74) 3L
 Experimental facts and theoretical speculations concerning storage and retrieval of mnemonic information in humans.
Prerequisite: PSY 207F/S and PSY 230F/STA 222/232/252 (In 1974-75 the prerequisite will be PSY 245S and PSY 230F/STA 222/232/252)
- PSY 310F Short-term Memory** 3L:MWF9
 A study of the recent methodological, empirical, and theoretical advances in the field of human short-term memory.
Prerequisite: PSY 207F/S and PSY 230F/STA 222/232/252. (In 1974-75 the prerequisite will be PSY 245S and PSY 230F/STA 222/232/252.)
- PSY 311S Discrimination Learning** (Not offered 1973-74) 3L
 Focus is on the current status of the various theories relevant to how organisms came to respond differentially to their stimulating environment. Most of the empirical work examined will deal with lower organisms. Offered in alternate years.
Prerequisite: PSY 206F/313S/220F/S and PSY 230F/STA 222/232/252
- PSY 315F Introduction to Mathematical Psychology** 3L:R4-7
 A selection of areas in mathematical psychology to introduce the student to the application of mathematical tools and concepts in psychological theorizing e.g. theories of scaling and measurement, stochastic theories of learning, applications of information theory, application of game-theoretical concepts.
Prerequisite: STA 222/232/252 and MAT 110/130/134/135/139
- PSY 319F Physiological Psychology: Physiology of Sensory-Motor Behaviour** (Not offered 1973-74)3L
 Physiological bases of sensory-perceptual and motor behaviour. Importance of developmental processes on sensory-motor coordination. Offered in alternate years.
Prerequisite: (PSY 209F and PSY 223F)/PSY 250/ZOO 222 and PSY 230F/201S/STA 222/232/242/252
- PSY 320 Learning Laboratory** 4P:M7-10 p.m. and N
 A series of three experimental projects to be conducted under the supervision of the instructor(s), at least one to involve the use of human subjects and at least one to involve the use of animal subjects. Each project includes the design of an experiment, data collection and analysis, and a written report. This course will be replaced by PSY 350 and 351 in 1974-75.
Prerequisite: PSY 206F/220S/313S and PSY 207F/S and PSY 201S/STA 222/232/252
- PSY 321 Sensation and Perception Laboratory** 4P:M7-10 p.m. and N
 A series of three or four experimental projects to be conducted under supervision of the instructor. Each project will include the design of an experiment, data collection, and a written report. Subject matter for the projects can be anything within the general area of perception and is limited only by the equipment available or the student's ingenuity in constructing or arranging such equipment.
Prerequisite: PSY 243S/208S and STA 222/232/252/PSY 201S

- PSY 322 **Physiological Psychology Laboratory** 4P:M4-7 and N
 A series of experimental projects in the general area of Physiological Psychology. Each project includes the design of an experiment, data collection and analysis, and a written report.
Prerequisite: PSY 206F/220S and PSY 241S/242S and PSY 201S/STA 222/232/252. (In 1974-75 the prerequisite will be PSY 250/ZOO 222 and STA 222/232/252.)
- PSY 323 **Social Psychology Laboratory** 4P:M4-7 and N
 A series of experimental projects in the general area of social psychology. Each project includes the design of an experiment, data collection and analysis, and a written report.
Prerequisite: PSY 203F/S, and STA 222/232/252
- PSY 324F **Animal Behaviour** 3S:W7-10p.m.
 Comparison of psychological and ethological approaches to the problems of the structure, causation, ontogeny and phylogeny of behaviour.
Prerequisites: PSY 206F/220S and PSY 209F/PSY 223F. (In 1974-75 the prerequisite will be PSY 250/ZOO 222 and PSY 220F/S.)
- PSY 326F **Comparative Psychology: Man as a Vertebrate** 3L:T7-10p.m.
 Man's psychology compared with that of other selected vertebrate species. Preliminary considerations: psychologist's approach to animal behaviour, precautions in attempting species comparisons, biological characteristics of the species, evolutionary status. Topics for species comparisons include sensation, perception, motivation, learning, and cognition.
Prerequisite: PSY 206F/207S/220S and PSY 230F/STA 222/232/252
- PSY 327F **History of Psychology** 3L:R2-4, M1
Prerequisite: One full-course equivalent in Psychology at the 200-level
- PSY 329S **Computer Applications to Psychology** (Not offered 1973-74) 3L
 A lecture course on the uses and limitations of computers in psychological research with emphasis on simulation and real time computers. Strongly recommended to students planning a career in experimental psychology.
Prerequisite: STA 222/232/252 and a knowledge of Fortran
- PSY 330F **Abnormal Psychology** 3L:W7-10p.m.
 An examination of theories and research in psycho-therapy and psychopathology.
Exclusion: PSY 221F/S
Prerequisite: PSY 230F/STA 222/232/252 and 3 half-courses in PSY at the 200-level
- PSY 330S **Abnormal Psychology** 3L:MWF9
 The same as PSY 330F
- PSY 337S **Communication and Cognition** 3L:T4-7p.m.
 Aspects of human information processing: perception of information in pictures and words; reading as a perceptual skill; the role of symbols and symbol systems, their maintenance and interference.
Prerequisite: PSY 230F/STA 222/232/252 and PSY 223F and PSY 207F/S224F/225F
- PSY 340S **Developmental Psychology: Social and Personality Development** 3L:MWF2
 Social attachment, aggression, morality, identification, achievement.
Exclusion: PSY 202F/S in 1969-70 or 1970-71
Prerequisite: PSY 202F/S (1971-72 or later) and PSY 206F/207F/S220S and PSY 230F/STA 222/232/252

- PSY 341S **Psychological Theory** 2L:R2-4, 1S:M1
 The functions, nature, and constituents of theory in psychology. How psychological theories are constructed and evaluated. Various contemporary and recent psychological theories and models are examined as illustrations. Offered in alternate years.
Prerequisite: PSY 230F and PSY 206F/207F/S/327F
- PSY 342S **Symbolic Processes** (Not offered 1973-74) 2S
 An examination of the nature of signs and symbols and their role in animal and human behaviour. The emphasis is on the representational use of symbolic processes through which the individual regulates his own behaviour, rather than the communicative use of symbolic processes, through which individuals influence one another. Offered in alternate years.
Prerequisite: PSY 230F/STA 222/232/252 and any two of PSY 206F/207F/S/301F/224F
- PSY 343F **Psychology of Aesthetics** 2L:T4-6
 An examination of artistic and other aesthetic activities with special reference to their bearing on fundamental problems of human motivation. Objectives, methods, and findings of experimental aesthetics. Offered in alternate years.
Prerequisite: PSY 230F/STA 222/232/252 and any two of PSY 206F/207F/S/211S/301F/S
- PSY 344F **Physiological Psychology: Cognitive Functions** 2L, 1S:MWF11
 This course stresses the use of evidence from research involving human subjects. Brain mechanisms underlying such functions as memory, language, perception, and attention will be investigated.
Prerequisite: PSY 209F/ZOO 222 and PSY 230F/STA 222/232/252 (these apply in 1973-74); PSY 250/ZOO 222 and PSY 230F/STA 222/232/252 (these apply in 1974-75).
- PSY 345S **Brain Mechanisms in Motivation and Species Specific Behaviour** (Not offered 1973-74) 3L
 This course will emphasize in depth examination of how the central nervous system coordinates and maintains the complex relationship between the physiological condition of the organism, the external environment, and the species specific motor sequences in such activities as eating, drinking, attack, flight, thermoregulation and copulation. It may also extend these considerations to those of behavioural change through development and learning. Data from experiments on non-human species will be the primary sources of information, but data from humans will be considered whenever they are available.
Exclusion: PSY 242S
Prerequisite: PSY 250/209F/ZOO 222 and PSY 230F/STA 222/232/252
- PSY 346S **Conditional and Behavioural Control II** 3L:MWF1
 This course represents an extension of the material covered in PSY 220, "Conditioning and Behavioural Control". Special emphasis will centre on a *comparison* of appetitive and aversive techniques of behavioural control. The application of these control procedures will be extended to examples of human behaviour.
Prerequisite: PSY 220F/S/206F and PSY 230F/STA 222/232/252
- PSY 347F **Current Research in Psychophysiology** 2L, 1S:MWF3
 Psychophysiological phenomena such as the galvanic skin response, heart rate, and electrical brain activity will be considered first as *indices* of other psychological processes (such as emotion, conditioning, awareness, etc.), and then as *behavioural processes* in their own right. There are two lectures per week, and one hour of student-led seminars, where students present library-research findings concerning certain specified issues in the field of psychophysiology. Readings are mainly drawn from the journal *Psychophysiology*.
Prerequisite: PSY 100 and PSY 230F/STA 222/232/252

- PSY 350 Conditioning and Learning Laboratory** (Not offered 1973-74) 4P
 This course will be introduced in 1974-75. It consists of a series of laboratory projects on topics covered in PSY 220F(S) viz. reinforcement, extinction, stimulus control, and the aversive control of behaviour. It will include prescribed exercises illustrating behavioural phenomena and methodology and student-generated projects.
Exclusion: PSY 320
Prerequisite: PSY 220F/S/206F and STA 222/232/252
- PSY 351 Memory and Learning Laboratory** (Not offered 1973-74) 4P
 This course will be introduced in 1974-75. It consists of laboratory projects on topics covered in PSY 225F and 245S viz. short- and long-term memory, verbal learning, perceptual and motor skills, concept learning, and cognitive processes. It will include prescribed exercises illustrating behavioural phenomena and methodology and student-generated projects.
Exclusion: PSY 320
Prerequisite: PSY 226S and STA 222/232/252
- PSY 360S Individual Projects** N
 An intensive laboratory or reading project undertaken by the student under the supervision of a staff member. Will be approved by the department under exceptional circumstances when the student and staff member can show that a certain programme which is academically demanding is peculiarly suitable for the individual student and cannot be provided through the regular course offerings.
Prerequisite: PSY 230F/STA 222/232/252 and appropriate background for the proposed work

COURSES OPEN TO FOURTH-YEAR STUDENTS

NOTE: Enrolments in the following courses are restricted. Third-year students who can demonstrate adequate preparation may request admission and this will be granted if space is available.

- PSY 400 Thesis** 2S:M4-6
 An individual research project done under the direction of a staff member.
Prerequisite: PSY 320/321/322/323
- PSY 402F Special Topics in Social Psychology** 2S:R9-11
 Examination in depth of a limited topic within social psychology. Content in any given year will depend on instructor.
Prerequisite: PSY 302S/304F/S/306S/323
- PSY 403S Special Topics in Developmental Psychology** 2S:T9-11
 Examination in depth of a limited topic within developmental psychology. Content in any given year will depend on instructor.
Prerequisite: PSY 300F/340F/301F/S (if PSY 202F/S was taken in 1969-70 or 1970-71 it may be substituted for PSY 340F)
- PSY 404S Special Topics in Abnormal Psychology** 2S:R9-11
 Examination in depth of a limited topic within Abnormal Psychology. Content in any given year will depend on instructor.
Prerequisite: PSY 330F (1971-72 or later) or (PSY 221F and PSY230F/STA 222/232/252 and three full course equivalents at the 200- or 300-level)

- PSY 405F **Special Topics in Personality** 2S:T9-11
 Examination in depth of a limited topic within the area of personality. Content in any given year will depend on instructor.
Prerequisite: (PSY 307S and one full-course equivalent at the 200- or 300-level other than PSY 204F/S) or (PSY 204F/S and PSY 230F/STA 222/232/252 and two full-course equivalents at the 200- or 300-level)
- PSY 406S **Special Topics in Perception** (Not offered 1973-74) 2S
 Examination in depth of a limited topic within the area of perception. Content in any given year will depend on instructor.
Prerequisite: PSY 230F/STA 222/232/252 and PSY 243S
- PSY 409F **Special Topics in Learning and Motivation** (Not offered 1973-74) 2S
 Examination in depth of a limited topic in learning. Content will depend on instructor.
Prerequisite: See departmental booklet
- PSY 410S **Special Topics in Mathematical Psychology** (Not offered 1973-74) 2S
 Examination in depth of a limited topic in mathematical psychology. Content will depend on instructor. Offered in alternate years.
Prerequisite: PSY 315F/S
- PSY 420S **Special Topics in Psychology** 2S:N
 Examination in depth of a limited topic in psychology. This course will be offered if 10 or more students secure the agreement of a member of staff to the coverage of a topic suggested by them. The proposal should be submitted to the department before pre-registration.

REL**RELIGIOUS STUDIES***Chairmen of Departments**Combined Departments for Religious Studies:*

Professor D.V. Wade

Professor E.E. Best (*Acting Chairman, July 1-December 31, 1973*)*Victoria College;*

Professor D.V. Wade

Professor E.E. Best (*Acting Chairman, July 1-December 31, 1973*)*Trinity College:*

Professor G.A.B. Watson

St. Michael's College:

Professor A.G. Gibson

Department of Near Eastern Studies, U.C.:

Professor R.F.G. Sweet

*Coordinator of Religious Studies,**Erindale College:*

Professor L. Elmer

Academic Secretary, Combined Departments:

Mr. R.C. Hutchinson

Enquiries:

Victoria College, Woodger Room (928-3926)

Religious Studies as an academic discipline is based upon a broad concept of the fundamental significance of religion in the life of the individual person and of society. The intention of the Combined Departments is to provide students with the opportunity to deepen their understanding of man and his institutions by exploring in various ways the ultimate questions and convictions which have affected the foundations of his life throughout history.

The breadth of the concept of religion which is assumed in the academic approach to it is reflected in the diversity of perspectives and methods involved in the courses that are offered by the Combined Departments as well as those recommended from other disciplines. Furthermore students participating in the study of religion are encouraged to bring to that study the instruments of critical and sensitive

enquiry which they have developed in other areas. Through the perspectives and methods of various disciplines, separately and in combination, fundamental assumptions and questions pertaining to personal and social values and beliefs, which are too frequently excluded from other forms of enquiry, are exposed and systematically probed in an intellectual atmosphere of freedom and thoroughness.

Throughout history man has expressed his profoundest convictions, questions, aspirations and fears in many ways. His art, philosophy, conduct, social institutions, even his theories about the universe, have conveyed and illuminated his measure of himself and of the world in which he lives. From time to time these forms of expression coalesce within a particular pattern and tradition which we may identify as a “great” or “world” religion. But along with such religions—both within them as well as outside them—are the individuals, each with his own personal convictions, values and interpretations of experience and of the symbols by which he represents to himself the ultimate concerns of life. The examination of all this constitutes the academic enterprise which we entitle Religious Studies.

To expand human awareness in areas which affect directly the foundations and quality of life is not easy, but in our age it is vitally important. To prepare for life, in addition to preparing for a career or for graduate study, is, among other things, to learn how to ask ultimate questions and work toward solutions. The Combined Departments for Religious Studies are committed to the encouraging of this process and to the critical and creative extension of it into areas of individual or corporate blindness.

A careful reading of course descriptions in Religious Studies will suggest to the student with more than one area of interest a number of ways in which a particular programme may be constructed, combining selections from Religious Studies with offerings from other departments. For example, courses may be combined with others in Philosophy, Psychology, Sociology or Political Science to create an investigation into the psychology of religious expression, the philosophical analysis of religious language, the sociological analysis of religious institutions, the political impact of religious institutions and belief, religious motivations of human behaviour etc. Similarly, religion and the arts can be creatively fashioned as an area of study by a selection of courses in Religion, Fine Art, Music and Literature. By combining courses in Religious Studies, Near Eastern Studies, East Asian Studies and Islamic Studies, a variety of programmes in religious and cultural beliefs may be planned; the focus here could be achieved through language study and through works in translation. There is every opportunity to penetrate the religious traditions of the west in depth as well as to engage in the comparative study of varied religious traditions east and west.

Students who wish to continue an interest or a concentration in Religious Studies into graduate schools of religion will find an increasingly wide opportunity to do so, and may think of their undergraduate study as preparation for this. Needless to say, there are also opportunities to use such a preparation as a basis for entrance into varied professional schools; increasingly such schools look not at the type of discipline in which a student has been “trained” but at the depth and breadth of his undergraduate education, as such. The same can be said of many employers.

For the student whose particular interests include both Religious Studies and Philosophy, the *Joint Programme in Religious Studies and Philosophy* provides an opportunity to achieve specialist certification in both disciplines. Further information regarding this programme may be obtained by consulting the bulletins of the Combined Departments for Religious Studies, the University Department of Philosophy, or the St. Michael’s College Department of Philosophy.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- REL 101 Introduction to Religion** 2L, 1T L1:MW11, L2:Eve, 1T:F11, T2:Eve
A basic course designed to equip the student for the study of world religions. Topics include: the present interest in world religions; problems of definition of religion; terms, concepts, skills and methods necessary in the study of religions; typical ways in which the great religions deal with basic concerns of mankind. *D.V. Wade* and staff.
Exclusion: REL 130
- REL 130 The Phenomenon of Religion** 2L:TR3, 1T:R4
Introduction to the descriptive and critical study of the world’s religions, illustrating the variety of religious traditions and different modes of inquiry into them. Themes include: religion and society; scripture, tradition and change; religious experience and its communication; problems of religious diversity. *W.G. Oxtoby, B.S. Alton.*
Exclusion: REL 101

- REL 150 **Christianity: The First Thousand Years** 2L:MW9, 1T:F9
A lecture and reading course in the history of the doctrines and institutions of the Christian Church in its first thousand years. *Mrs. J. Dewart.*
- REL 160 **Basic Ideas and Practices of the Jewish Religion** (Not offered 1973-74) 2L,1T
The course deals with the central themes of Classical Judaism, i.e., biblical-pharisaic thought and devotional life. Central affirmations such as covenant, Torah, God and Man will be explored. The holidays and observances will be analyzed. Some time will be devoted to contemporary Jewish denominations.
- REL 170 **Introduction to Twentieth Century Christian Thought** (Not offered 1973-74) 1L, 2T
A study of the various ways in which Christian thought has developed in the light of the changing experience of modern man and the evolution of human society. The tutorials, comprising the principal part of the course, will discuss selected readings from a wide range of Catholic and Protestant authors. A weekly lecture will deal with the background of the readings. *L.S. Dewart.*
- REL 180 **Systematic Self-Awareness and the Question of God** 2L:TR10, 1T:N
This course consists of an in-depth descriptive and critical investigation of (1) conscious activities insofar as they are human, (2) conscious activities insofar as they are religious, (3) the evidence for the existence and presence of "God", and (4) the phenomenon of evil. The student is encouraged to integrate this investigation with his work in other areas of particular personal interest. *J.M. Vertin.*
- REL 190 **Contemporary Problems in Religious Ethics** (Formerly REL 210) 1L, 1T:MW10
Lectures will deal with the general problem of analyzing ethical issues in the context of religious studies. Issues such as: poverty, racism, abortion, genetic engineering, changing roles of men and women, marriage and the family, drug use, the contemporary relevance of organized religion, etc., will be discussed in the tutorials. *R.C. Hutchinson.*
- REL 200 **Ancient Myth and Ritual** 2L:MW1, 1T:N
An introduction to religious symbolism recurring in myths and rituals from the Neolithic age to the threshold of the historic world religions; cyclic time and cosmic circles; death and rebirth of the corn God; sky, water, earth, sex and other natural manifestations of the sacred; an examination of the contributions of Eliade, Van de Leeuw, Kristensen and Jung to the phenomenological study of religion. *J.T. O'Connell.*
- REL 202S **Division and Reunion of the Christian Church** 2L:MW3, 1T:N
A study of the social and theological causes of the major divisions of the Christian Church and of sectarian movements in the nineteenth century. This is followed by a brief look at the apparent reversal of these trends in the twentieth century, e.g. the Ecumenical Movement, organic unions, and new attitudes since Vatican II. *K.J. Joblin.*
Reference: M. Marty, A Short History of Christianity
- REL 203 **Religion and Imaginative Literature** 2L:TR12, 1T:N
Analysis and interpretation of different kinds of religious insights in great authors; developments of responsible approaches to the seriousness of the concerns expressed in various kinds of literature: Dostoievsky, Tolstoy, Joyce, Eliot, Mauriac, Bernanos, Camus, Miller, Salinger, Updike, St. Exupéry. *D.E. Belyea.*
- REL 204 **Religion and Science** 2L, 1T:MW12
The challenge of scientific methods and theories to western religious thought, with particular reference to: empiricism and agnosticism; evolutionary theory and the concept of cosmic design; social science critiques of religion and culture; the status of theories and models; the new physics and biology; technology, cybernetics and social engineering.
B.S. Alton.
Basic text: Ian Barbour, Issues in Science and Religion

- REL 205 **Sociology of Culture and Religion** 2L:MW11,1T:F11
A study of the interaction of culture and religion in the western world in order to clarify the role played by religion in the process of cultural creation and transformation. Special attention will be paid to the theories of Tocqueville, Marx, Weber, Durkheim, *et al.* *G.G. Baum.*
- REL 207F **Religion in Chinese Society** 2L:TR10, 1T:N
Early religion; Confucius and Confucianism; Taoism, mystical and popular; Buddhism; the impact of the West; Maoism. This course deals with the strands that interwove to produce the most stable of the world's civilizations, and concludes with the situation today. *K.J. Joblin.*
- REL 208S **Religion in Modern Japanese Society** (Not offered 1973-74) 2L, 1T
Modern Japan from the beginning of the Meiji Period until the present: a case study of the impact of industrial and technological society on traditional religious and cultural life. The role of the new religions as well as the older traditions in contemporary Japanese society. *E.E. Best.*
- REL 209 **Contemporary Perspectives in Religious Thought** 1L:M10, 1T:F10/W10
The contemporary religious situation, secularization and its interpretations, death-of-God theologies, the quest for meaning, the new mysticism, varieties of religious humanism, problems of faith and belief. Response of Jewish-Christian religious thought to changing patterns of understanding, e.g., The Marxist challenge. *A.T. Davies.*
- REL 211S **Communications Media and Religious Consciousness** (Not offered 1973-74) 2L, 1T
Varieties of communication considered as determinants of types of religious consciousness. The following themes will be analyzed: (1) myth, ritual, and role; (2) meditation, autobiography, and identity; (3) imagination, art, and selfhood.
- REL 212 **Christianity: The Second Thousand Years** 2L:TR10, 1T:N
A survey of major Christian ideas, personalities, institutions and movements from the time of the East-West schism to the post-Vatican II period. Topics treated include monasticism, scholasticism, papacy, Reformation, counter-Reformation, church-state interaction and other areas suggested by students. *H.J. McSorley.*
- REL 217F **Introduction to Protestant Thought** 2L:TR2
The sources and major themes of Protestant Christianity as interpreted from the Reformation until the present day: justification, election, grace, religious authority, vocation, ethics. This course is designed to introduce the student to the Protestant tradition, its central ideas, its various expressions, its greatest thinkers and its continued relevance. *A.T. Davies.*
- REL 218 **Religion in the Context of Human Development** 2L:TR11, 1T:T10/R10
A study of the changing roles and characteristics of religion in the process of growth and development of individuals and societies. *G.A.B. Watson.*
- REL 219F **Mysticism in America** (Not offered 1973-74) 2L, 1T
A survey of varieties of mysticism in America including Christian, Hasidic, oriental, chemical, esoteric, ecstatic, and sectarian approaches. *H.W. Richardson.*
- REL 220 **Major Religious Traditions, East and West** 2L:TR11, 1T:N
A study of the ideas, attitudes, practices, and contemporary situation of the Judaic, Christian, Muslim, Hindu, Buddhist, Confucian, Taoist, and Shinto faiths. *K.J. Joblin* and staff.

- REL 221 **Jesus Christ: Yesterday and Today** (Not offered 1972-73) 2L, 1T
A study of Jesus Christ in terms of "the Jesus of history and the Christ of faith", the classical Christological controversies, and modern ideas of Christ, including the question of Jesus' self-consciousness, the cosmic Christ, etc. *J. Dewart.*
- REL 222 **Religion and Society** (Formerly REL 140F) 2L:MW2, 1T:F2
A study of the interaction between religion and society using the methods developed by social scientists such as M. Yinger and E. Nottingham. Case-studies will include: Protestantism and the rise of capitalism; the Puritan Revolution in England; religion and revolution in Burma; sectarian movements in Canada; new religious movements in North America. *R.C. Hutchinson.*
- REL 223 **The Rejection of Religion in the 19th Century** 3S:MWF12
An examination of the sources of hostility to "religion" in the 19th century with special reference to Feuerbach, Marx, Comte and Mill. This will involve a careful reading of selected texts: Feuerbach, *The Essence of Christianity*; Marx, Engels, *On Religion*; Comte, *Introduction to Positive Philosophy*; Mill, *Three Essays on Religion*. *D.R.G. Owen.*
- REL 224 **The Concept of God** 2L:T2-4, 1T:N
A study of the origins and development of the concept of God in primitive religion, the Old Testament, Greek philosophy, and in early, mediaeval and modern Christianity, with special emphasis on 20th century theological problems and recent literature on the question. *L.S. Dewart.*
- REL 225 **Revolution, Liberalism, and the Church of Rome** 2L:MW11, 1T:N
An analysis of the relationship of Roman Catholics to the liberal intellectual, social, and political revolutions in western Europe during the 18th and 19th centuries. *P.J. Schiefen.*
- REL 226F **Christianity as Counter Culture** 2S:W4-6
The yes-and-no dialectics of Christianity examined in models of political theology, liturgy, spirituality and particular life styles. Lectures, Readings, Tutorials. *E. Skublics.*
- REL 227S **The Middle East: Mystique and Passion** 2L:T11-1
The significance of Israel/Palestine or Jerusalem as "holy" in the three major monotheistic traditions (Jewish, Christian and Muslim), with particular attention to the role of these communities' claims in interreligious relationships during recent years. *W.G. Oxtoby.*

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- REL 300 **Modern Atheism** 2L:TR11, 1T:N
Roots, causes and forms of modern atheism; atheist-theist confrontation and dialogue in context of "global village," electronic revolution, space exploration; substitutes for God; the new orthodoxy. *A.G. Gibson.*
- REL 302 **Architects of Modern Religious Thought** (Not offered 1973-74) 2L, 1T
Recent and contemporary thinkers, schools and trends in religious philosophy and their respective relevance to human problems. Special attention will be given to existential and scientific developments. Among those who may be studied are: Marcel, Heidegger, Buber, Heschel, Jung, Bonhoeffer, Tillich, Bultmann, Teilhard, and today's radical theologians and secularizers. *D.V. Wade.*
- REL 303 **Christian Origins** 1L:T10, 2T:R9-11
The formation and development of Christianity from the beginnings to 150 A.D. with particular reference to its Jewish religious and historical backgrounds. *J.C. Meagher.*

- REL 304F **Religion and Culture in Asia** (Not offered 1973-74) 2S
 A contemporary study. Religion as a cultural determinant in the Far East, Southeast Asia and India. Cultural facets of religious and ethical values and themes. Religion, especially Buddhism, and the encounter with Communism in Asia. The role of Asian religion in the quest for peace, international affairs, East-West understanding and world community. *D.V. Wade.*
- REL 305S **Christian Worship and Spirituality** (Not offered 1973-74) 2S
 Christian religious experience in its psycho-somatic embodiment of liturgical symbolism (communal word and movement) and personal spirituality. A historical, psychological, theological and practical inquiry. *E. Skublics.*
- REL 306 **Protestant and Catholic Theologies in Convergence** 2L:TR2, 1T:N
 An investigation of the origins of the Protestant-Catholic separation and a demonstration of the growing areas of agreement between Protestant and Catholic theologians in the ecumenical dialogue. Special attention to the contributions of K. Rahner, H. Kung, E. Kasemann, and G. Lindbeck, *H.J. McSorley.*
- REL 311F **The Earliest Christian Literature** 2L:MW3, 1T:F3
 A study of the earliest Christian writings that survive (the letters of Paul) and of the earliest Gospel (the Gospel according to Mark). *J.C. Hurd.*
- REL 313S **Woman as a Religious Symbol** (Not offered 1973-74) 2L, 1T
 Woman as symbol of the divine, the devout and the demonic in religious literature with special reference to the place of the mother of Jesus in the Christian tradition. *J.E. Bruns.*
- REL 315 **Religion in Canada** 2S:TR3
 The changing role and nature of religion in Canadian society. Historical roots of "White, Anglo-Saxon, Protestant", French-Catholic, and "secular" dominance; impact of industrialization; transition to "post-Christian" society; recent developments; e.g. Sunday observance, religion in the schools, treatment of natives and minorities, the Church in Quebec, Ecumenical, Pentecostal and Jesus Movements. *R.C. Hutchinson.*
- REL 316 **Religion and Social Change** 2L:MW1, 1T:N
 On what bases does social change take place in contemporary society? What are the values which underlie such change? What role, if any, does religion play in the choice of individual life styles and the direction of social change? Special attention will be paid to the "images of man" involved in the varied models for social change. *E.E. Best.*
- REL 317F **Theories in World Religions** (Formerly REL 328S) 2S:W4-6
 A review of representative 19th- and 20th-century theories dealing with the diversity of religions. The material includes major lines of behavioural-science theory of primitive and literate religions, as well as theological evaluations of "religion" in general. *W.G. Oxtoby.*
Exclusion: REL 206 (1971-72)
- REL 318S **Religious Education** (Formerly REL 318) 2S:W4-6
 Major elements in the construction of a philosophy of religious education: theories of religious education as they reveal assumptions about the nature of religion and the aims of education; whether religion can be taught; the place of religion in public education; methodology; the influence of institutions; individuals and personal development. *B.S. Alton.*
Prerequisite: 3 full courses in REL, among which REL 317F is highly recommended.

- REL 319 **The Theology of Ingmar Bergman** 2L:T4-6, T:N
A critical analysis of *Smiles of a Summer Night*, *The Seventh Seal*, *Wild Strawberries*, *The Magician*, *The Virgin Spring*, *Through a Glass Darkly*, *Winter Light*, *The Silence*, *Persona*, *Hour of the Wolf*, *Shame*, *The Ritual*, *Passions of Anna*. *A.G. Gibson*.
- REL 320 **The Mythological Framework of Western Culture** 2L:TR1, 1T:N
This course will deal with, in approximately equal proportions, (a) the Bible and (b) Classical mythology. The Bible and various works of Greek and Latin literature will be approached through an examination of their recurrent themes and images. Some attempt will be made to indicate how these two structures of myth and symbolism, combined together, have conditioned the poetry and thought of the western world. *H. Frye, J. Macpherson*.
- REL 321S **Religion in Korean Society** 2S:TR12
The religious beliefs of the Korean people: animism; shamanism; Buddhism; Confucianism; Christianity; Ch'ondo'gyo; the period of Japanese rule and Shinto; minor cults; and the new religions. These are studied historically and compared with Chinese, Man-churian and Japanese beliefs and practices. *R.H. Macdonald*.
- REL 322 **Utopian Theologies in the West** 2S:M3-5
Utopian and millennialist theories, historical and contemporary, studied with a view to analyzing their philosophical and theological judgments about the ideal form of human association. Classical Jewish and Christian theories, general utopian literature, socialist and Marxist egalitarianism, American utopianism, Zionism, communalism, etc. *B.S. Alton*.
- REL 323S **Anti-Semitism** 2L:TR2, 1T:N
An analysis of the religious as well as the socio-political sources of anti-semitism as a disease in western history. Theological interpretations. Jewish-Christian relations past and present in light of anti-semitism. The situation after Auschwitz. *A.T. Davies*.
- REL 324S **Eastern Christianity** 2L:MW10, 1T:N
An examination of the history and spirit of Christian theology in the East and Eastern approach to such issues as Christology, the Church, authority, liturgy, and eschatology. *P.B. Bilaniuk*.
- REL 325 **Teilhard de Chardin: His Impact on Modern Man** 2L:MW1, 1T:N
Cosmic and biological evolution—biblical, theological, and philosophical dimensions; hominization and the personalizing universe; the mystery of matter and spirit; cosmic spirituality; the mystery of evil and sin; the energetics of love; the Omega Point and the Cosmic Christ; beyond the Teilhardian synthesis. *P.B. Bilaniuk*.
- REL 326S **Man's Wholeness Through the Unconscious: A Study of Jung** 3L:M9, F-11
After his famous "break" with Sigmund Freud, Carl Jung developed a highly controversial system for understanding human personality. Throughout his work he emphasized that man can achieve wholeness only through a knowledge and acceptance of the unconscious—a knowledge acquired through dreams and symbols. This course will offer an overview of Jung's system, deal with selected issues of dreams and symbols, and consider some of the implications of these for religious expression, contemporary understandings of man individually and collectively, and therapy. *J. Reed*.
- REL 332S **Comparative Religious Ethics** 2S:TR12
A study of the ethical teachings and attitudes of the great religious traditions. The purpose of the course is not to offer a detailed point by point comparison of similarities and differences in the ethical positions associated with the great religions but rather to study basic similarities and radical differences, and to ask: How do the axioms and presuppositions of a given religion determine the ethics associated with it? *D.V. Wade*.

- REL 333 **Reformation in the 16th Century** 2L, 1T:MWF10
 A study of the Reformation period as formative of the modern Christian consciousness. Emphasis in the lectures will be laid on the interplay of varied individual and local efforts to reform and renew the Church. Tutorial sessions will provide opportunities for more concentrated discussion of outstanding individuals, including Erasmus, Luther, Zwingli, Cranmer, Calvin, Loyola and Caraffa. *J.W. Grant.*
- REL 334S **The Letters and Revelation of John** 2L, 1T:MWF11
 A consideration of the theology of 1 John, the historical situation revealed in 2 and 3 John, the relationship of these letters to the fourth gospel and the relationship of the Apocalypse of John to the other 'Johannine' writings. *J.E. Bruns.*
- REL 335 **Christian Thought in England (16th-20th Centuries)** 2S:R9-11
 An examination of the philosophical interpretation of the Christian Faith as given by some typical English theologians since the Reformation. This examination will involve selected readings in the following texts: Hooker, *Ecclesiastical Polity*, (Book 1); C.R. Cragg, *The Cambridge Platonists*; Butler, *Analogy of Religion*; Gore, *Reconstruction of Belief*; Temple, *Nature, Man and God*. *D.R.G. Owen.*
- REL 336S **Zen, East and West** 2L:TR10, 1T:N
 An investigation of Zen both in terms of its traditional religious claims and its current influence in the Western world, especially as interpreted through the works of D.T. Suzuki. Special attention will be paid to the influence of Zen upon Japanese culture and the possibilities for a similar cultural influence upon the wider scene. *E.E. Best.*
Prerequisite: REL 207F (recommended)
- REL 337 **Theology of Hope** 2L:TR10, 1T:N
 The theology of orientation to the future as a religious attitude as exemplified in the Christian scriptures, classical Christianity, the writings of Bloch, Moltmann, Teilhard and others. *J. Dewart.*
- INV 370 **The Bible and English Literature**
 (See INV 370 under "Victoria College Courses")
- REL 400 **Individual Reading and Research** N
 Student-initiated projects arranged in co-operation with chosen instructors.
- REL 401 **Seminar in Comparative Religion** 2S:MW10
 The concerns and attitudes of the major religions in their classic expressions will be compared with the concerns that are dominant in current periodicals emanating from centres that reflect official and unofficial opinion in those faiths. *K.J. Joblin.*
Prerequisite: An introductory course in world religions
- REL 402 **Comparative Scriptures** (Not offered in 1973-74) 2S
 A study of the writings regarded as authoritative in the major world religions from such points of view as: their official as compared with their popular status; their importance as symbols of the sacred and as elements in liturgy; their common themes. *K.J. Joblin.*
Prerequisite: An introductory course in world religions
- REL 403S **Kierkegaard Studies** (Not offered 1973-74) 2S
 Kierkegaard as a religious thinker. A study of those aspects and categories of his thought which significantly moulded later theology and philosophy of religion. *D.V. Wade.*

- REL 404 **Religious Ethics** (Not offered 1973-74) 2S
 Religion and the decision-making process. The relation between our views of ultimacy and the value judgments we make in interpersonal relationships as well as within the structures of society. The elements which make up the decision-making process. This course will involve theological, sociological and ethical analysis. *E.E. Best.*
- REL 405 **Science and Religion** (Not offered 1973-74) 2S
 Science and technology as theological substitute. Various scientific theories, philosophical systems, as well as science and technology in general, will be examined as symbol- and value-systems entered into as alternatives to explicitly religious commitments. The goal will be explicate theology and its substitutes in terms of the fundamental criteria for an adequate theological perspective. *B.S. Alton.*
- REL 406 **The Religious Implications of the Sociology of Knowledge** (Not offered 1973-74) 2S
 A study of Karl Marx's theory of ideology and consciousness. Max Weber's thesis on religion and the formation of consciousness, and the sociology of knowledge of Karl Mannheim, Max Scheler, and contemporary sociologists. Special attention will be paid throughout to the interrelation of religion and society. *G.G. Baum.*
- REL 408F **Religion and Culture in Ancient Arabia** 2S:R11-1
 Interacting elements in the background of Islam: nomads and settled populations, Semitic, Greco-Roman, and Iranian cultural traditions; pagans, Jews and Christians in Arabia and adjoining regions. *W.G. Oxtoby.*
- REL 409S **Zoroastrianism** 2S:R11-1
 Interpretations of the development of religion in Achaemenid Iran and its elaboration in Sasanian Iran and the Parsi community of India. Topics include Zoroastrian teaching on the struggle between good and evil, and the influence of Zoroastrianism on other religious traditions. *W.G. Oxtoby.*
- REL 411F **Selected Major Christian Theologians** 2S:N
 A representative selection of classical theological writings from the Christian past, including the period of the church fathers, the Middle Ages, the Reformation and its aftermath. *E.R. Fairweather.*
- REL 414 **Authority, Responsibility, and Freedom in Religion** 2L:TR9, T1:T10, T2:R10
 An examination of these principles in various manifestations of religion and religious life through a study of selected Western theologians, philosophers, and others. *G.A.B. Watson.*
- REL 415 **Critical Issues for Religious Ethics** 2S:R4-6
 An in-depth analysis of one or two areas of special importance for contemporary society which call for the exercise of ethical value judgments, e.g., war and non-violence, liberation movements, bio-ethics, planning, authority and human freedom. *E.E. Best.*
- REL 416F **Religion and Alienation** 2S:TR11
 A systematic study of the theories of man's progressive self-estrangement and the ways in which this has been related to religion. Religion as source of alienation and de-alienation. *G.G. Baum.*
- REL 417S **The Changing Concept of Secularization** 2S:TR11
 The concept of secularization: analysing the term as a 19th century slogan of cultural emancipation, its avoidance by Hegel and Marx, the sociological theories of M. Weber, H. Becker, and T. Parsons, and the theological ideas of contemporary thinkers such as F. Gogarten, H. Cox, J. Robinson and L. Dewart. *G.G. Baum.*

RUSSIAN - See SLA under "Slavic Languages and Literatures"

SERBO-CROATIAN - See SLA under "Slavic Languages and Literatures"

ST. MICHAEL'S COLLEGE COURSES - See INM

<i>Chairman of Department:</i>	Professor A.K. Warder
<i>Undergraduate Secretary:</i>	Professor C.D.C. Priestley (928-7257)
<i>Enquiries:</i>	280 Huron Street, Room 333 (928-7256)

India, ancient and modern, attracts interest in the West because it is unknown and different. It is a society, a civilization, whose standards and values are different, whose religious background especially does not make the assumptions and impose the inhibitions long dominant in Western culture. Every civilization is an experiment in life and also a control on other experiments. India's experiment has been a very long one and it has also left a long record depicting and discussing life: what is the aim of life, how should we enjoy it, what is happiness? To live in the modern world, we suggest it is a great advantage to have a knowledge of two civilizations, one's own and another, and we believe India will be found the most rewarding other.

Of our first year courses, one (SIS 100) offers a visual experience of modern India through slides, films and dancing as well as a general introduction to Indian civilization. When we seek to understand this society, its art and its ideas, we have to trace the sources from which the ideas spring. Wherever we start in India, if we trace the sources of what we find which is distinctively Indian, we discover them in Sanskrit literature, for Sanskrit has for thousands of years been the common language of the whole of India. India's modern quest for a national image has increasingly taken her people to the sources deep in the past yet ever young and creative. Even while assimilating foreign technology, the people of India have wanted to reassert their own ideals and to rediscover their own heritage. Because the heart of the Indian tradition is to be found in Sanskrit literature, the Department of Sanskrit and Indian Studies has made Sanskrit language and literature the central core of its programmes. The four year sequence begins with SIS 110. There is also a four year sequence on Buddhism, which is a special interest of this Department.

In the West, Indian culture is perhaps most visible in the forms of Buddhism, Krishna worship, Yoga, curry, music and dancing. All these derive from the same Sanskrit-based tradition and flow outwards from classic books written in Sanskrit (in the case of Buddhism also Pali, a dialect closely related to it). The courses in this Department are designed to make all aspects of the tradition accessible through their classic expositions. Indian theatre is unfamiliar in the West only because of the difficulty of bringing it here, but along with the other literature (poetry, novels, short stories) and Indian literary criticism it forms the richest part of the whole tradition, in which life is most fully reflected. The Department offers additional courses which, in conjunction with the central Sanskrit sequence, provide a programme in Indian Literature. For students interested in Indian Philosophy or Indian History, parallel sequences are offered to make possible programmes in either of these. It is feasible to combine such a sequence in this Department with one in another department, for example the Department of Philosophy, to produce a double programme.

For more detailed information and advice concerning courses and programmes of study in this Department, please contact the Undergraduate Secretary.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

SIS 100	Introduction to India	4S:MW7.30-9.30p.m.
	A course dealing with the various facets of Indian civilization. India's traditions in art, religion, philosophy and literature will be dealt with, along with a preview of contemporary Indian life and institutions. <i>N.K. Wagle</i> and staff.	
SIS 110	Elementar- Sanskrit	4S:TR4-6
	An introduction to the language of traditional Indian civilization. The first term will emphasize grammar and the spoken approach; in the second term there will be readings from Sanskrit literature. No previous knowledge of Sanskrit is required. <i>J.L. Masson</i> . <i>References:</i> Macdonnell, <i>Sanskrit Grammar</i> ; Masson and Keiler, <i>Introduction to Classical Sanskrit</i> (provided in class)	

- JES 126 **Visual and Performing Arts in East and South Asia**
(See JES under "Joint Courses")
- SIS 160 **Introduction to Buddhism** 2S S1:T4-6, S2:R4-6, S3:T7.30-9.30p.m.
The Buddha and his teaching and how this has evolved into the Theravada, Mahāyāna and other traditions of Buddhist thought. The course aims to elucidate the main doctrines common to all forms of Buddhism, such as transmigration, impermanence, non-soul, the nature of consciousness, the nature of unhappiness, meditation and Nirvana, and also to examine Buddhist social teaching. *C.D.C. Priestley, A.K. Warder, S. Katsura.*
- SIS 201 **Modern Psychology and Ancient India** 2S:M7.30-9.30p.m.
An examination according to classical Freudian psychoanalytic theory of some of the basic texts of Hinduism, Jainism and Buddhism, with detailed study of the childhood of Krishna. *J.L. Masson*
- SIS 226 **Indian Literature in Translation**
- SIS 230 **Survey of Social and Economic History of India**
- SIS 240 **Introduction to Indian Philosophy**
- SIS 250 **Introduction to Hinduism**
- SIS 260 **Buddhist Philosophy**

(These courses are described in the section which follows)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- SIS 210 **Intermediate Sanskrit** 3S:N
Sanskrit grammar, and readings from the *Upamitibhavaprapañcā*, the *Chāndogyaopaniṣad* and the *Ubhayābhisārikā*.
Prerequisite: SIS 110 (EAS 110 in 1971-72)
- SIS 211 **Introductory Modern Hindi** 4L, 1P:N
The official language of modern India.
- SIS 220 **Intermediate Sanskrit Literature** 3S:N
Selections from two epics, the *Rāmāyaṇa* and the *Saundarananda*, and a lyric poem, the *Meghasandēśa*.
Prerequisite: SIS 110 (EAS 110 in 1971-72)
Co-requisite: SIS 210
- SIS 226 **Indian Literature in Translation** 3S:T7.30-9.30p.m.
A historical survey of Indian literature, with reading of recommended translations of characteristic dramas, fiction, poetry and criticism. *G.T. Artola.*
- SIS 230 **Survey of Social and Economic History of India** (Not offered 1973-74) 2S
Social institutions (family, kinship, marriage and caste) and economic and administrative history (up to the nineteenth century), as revealed in India's literature and as recorded by ancient and modern observers. *N.K. Wagle.*
- SIS 240 **Introduction to Indian Philosophy** 3S:MWF10
A historical survey of the most important schools of ancient Indian philosophy (including Jainism and Buddhism), with special attention to the problems of knowledge, self and freedom in the development of scepticism and idealism. The course will also include a rational examination of Yoga and Tantra. *B.K. Matilal.*

- SIS 250 **Introduction to Hinduism** 2S:R7.30-9.30p.m.
A historically-oriented survey of the religious and social development of Hinduism down to the nineteenth century. *R.M. Smith.*
- SIS 260 **Buddhist Philosophy** 2S:R7.30-9.30p.m.
The special doctrines of the early schools and the main philosophies of the Mahāyāna: analysis of phenomena in the Abhidharma, the Mādhyamika critique of being and non-being, the mind-only philosophy of the Vijñānavāda, and the epistemology and logic of Dignāga and his followers.
- SIS 315 **Introductory Pali**
- SIS 326 **Indian Drama in Translation: Theory and Practice**
- SIS 330F **Indian History and Archaeology to 700 A.D.**
- SIS 331S **Mediaeval Indian Kingdoms, 700-1800 A.D.**
- SIS 340 **Ancient Indian Philosophy**
- SIS 370F **Indian Ornament**
- SIS 371S **Southeast Asian Art**

(These courses are described in the section which follows)

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- SIS 310 **Higher Sanskrit** 3S:N
Kādambarī, with selections from either the *Purānas*, *Mahābhārata* and *Kalhaṇa* or the *Vaiśeṣika Sūtra* and the *Mūlamadhyamakakārikā* or Amaruka and the *Bhagavadajjukīya*.
Prerequisite: SIS 210 (EAS 210 in 1971-72)
- SIS 311 **Readings in Hindi** 4S:N
Selections from Hindi texts.
Prerequisite: SIS 211 (EAS 215 in 1971-72)
- SIS 315 **Introductory Pali** 3S:N
The language of the Buddhist Tipiṭaka preserved by the Theravāda in Ceylon and South-east Asia.
- SIS 320 **Higher Sanskrit Literature** 3S:N
Selections from the *Ṛgveda*, *Svapnavāsavadatta* and the *Nāṭyaśāstra* I and VI; the theory of the classical Indian drama according to original Sanskrit texts.
Prerequisite: SIS 210 (EAS 211 in 1971-72)
Co-requisite: SIS 310
- SIS 326 **Indian Drama in Translation: Theory and Practice** 3S:MWF5
The course covers the main classical tradition of Sanskrit and Prakrit plays and also Kathakali as representing the more popular theatre. Dramatic theory and criticism will be studied from the *Nāṭyaśāstra* and other texts, including the *Hastalakṣaṇadīpikā* for Kathakali. Selected plays will be read in translation and analysed in the light of Indian dramatic criticism. *G.T. Artola.*

- SIS 330F **Indian History and Archaeology to 700 A.D.** 3S:MWF12
Ancient and early mediaeval history and archaeology of India. The emphasis will be on reading archaeological reports, and relevant original texts and inscriptions in translation. No language requirement. *N.K. Wagle.*
- SIS 331S **Mediaeval Indian Kingdoms, 700-1800 A.D.** 3S:MWF12
The course emphasizes the continuity of Indian traditional institutions as maintained by indigenous rulers when they encountered the Muslim expansion. Problems of Mediaeval Indian historiography will also be discussed. No language requirement. *N.K. Wagle.*
- HIS 332 **Modern India: the 19th and 20th Centuries**
(See HIS 332 under "History")
- JES 333 **Chinese Buddhist Philosophy**
(See JES under "Joint Courses")
- SIS 340 **Ancient Indian Philosophy** 3S:N
From the origins up to and including Nāgārjuna. *B.K. Matilal* and *S. Katsura.*
Prerequisite: SIS 240 (EAS 213 in 1971-72)
- SIS 370F **Indian Ornament** 2S:TR12
A chronological study of Indian ornament. *R. M. Smith.*
- SIS 371S **Southeast Asian Art** 2S:TR12
A general course on the art of Greater India. *R.M. Smith.*
- SIS 415 **Higher Pali**
- SIS 426 **Indian Poetics and Criticism in Translation**
- SIS 430 **Study of a Special Period of Indian History**
- SIS 440 **Mediaeval Indian Philosophy**

(These courses are described in the section which follows)

COURSES OPEN TO FOURTH-YEAR STUDENTS

- SIS 410 **Advanced Sanskrit** 3S:N
Arthaśāstra, with either *Harṣacarita* and selected inscriptions or *Nyāyasūtra* and *Nyāya-bindu* or *Uttararāmacarita* and *Kirātārjunīya* I with Mallinatha's commentary.
Prerequisite: SIS 310 (EAS 302/303/310 in 1971-72)
- SIS 415 **Higher Pali** 3S:N
A philosophical text, the *Poṭṭhapādasuttanta*; lyric poetry, *Suttanipāta*, *Cūlavagga*; and epic poetry, the *Bhūridattajātaka.*
Prerequisite: SIS 315 (EAS 317 in 1971-72)
- SIS 420 **Advanced Sanskrit Literature** 3S:N
The study of Indian poetics and criticism from original sources, including detailed study of Bhāmaha's *Kāvya-lāṅkāra*; *Mṛcchakaṭika* and selections from the *Rgvedasaṃhitā.*
Prerequisite: SIS 320 (EAS 311 in 1971-72)
Co-requisite: SIS 410

- SIS 426 **Indian Poetics and Criticism in Translation** 3S:N
 A study of Indian literary and critical theories from ancient and traditional sources, with special reference to Bhāmaha and Ānandavardhana, and reading of selected works of literature. *G.T. Artola.*
Prerequisite: SIS 226/326/320 (EAS 214/314/311 in 1971-72)
- SIS 430 **Study of a Special Period of Indian History** (Not offered 1973-74) 2S
N.K. Wagle.
Prerequisites: SIS 210, 230; 330/331
- SIS 432 **Marathi for Students of Indian History** 3S:N
 Readings in Marathi *bakhar*, *abhanga*, and *ovī* literary forms. *N.K. Wagle.*
Prerequisite: SIS 310, 331 (EAS 302, 312 in 1971-72)
- SIS 440 **Mediaeval Indian Philosophy** 3S:N
 After Nāgārjuna, with emphasis on logic and aesthetics. *B.K. Matilal.*
Prerequisite: SIS 340 (EAS 313 in 1971-72)

SLA

SLAVIC LANGUAGES AND LITERATURES

<i>Chairman of Department:</i>	Professor C.H. Bedford
<i>Undergraduate Secretary:</i>	Professor D. Struk
<i>Enquiries:</i>	21 Sussex Ave., Room 109 (928-3418)

The Department of Slavic Languages and Literatures offers an extensive range of courses in Russian language and literature, four-year sequences in Czech (and Slovak), Polish, Serbo-Croatian and Ukrainian languages and literatures, and some advanced courses in Slavic linguistics. Within this range there are courses suitable for inclusion in a wide variety of programmes of study, whether or not the student has studied Russian in Grade XIII. Some students may specialize intensively in Russian language and literature. Others may simply wish to gain a working knowledge of Russian to aid their reading of important material in another field, as, for example, science or social science. The other Slavic languages and literatures may also be included in any programme, even in a programme that does not include Russian. Language study in the Department emphasizes skills in using literary materials, and it also employs oral methods, combining small instructional groups with some laboratory or conversational practice.

Students who have not studied Russian in secondary school should not consider themselves at a disadvantage when considering specialization in the Russian or Slavic field. It is still not common for secondary schools to offer Russian, and the University of Toronto programme in language is by itself capable of providing a very good foundation for specialized work.

Students who have studied Russian in secondary school and would like to continue it should take SLA 121, which will prepare the student for entering SLA 320 in his second year. If a student is inclined to begin a specialization in Russian or Slavic at the University, he should include SLA 100 (first-year Russian) in the First Year programme. Also recommended for First Year students with an interest in the Russian field, whether or not they are studying Russian language, is the course "Masterworks in Russian Literature in Translation" (SLA 211) which is designed to serve as an introduction to some great works of Russian literature and to some significant aspects of Russian intellectual and social development.

Students in the First Year should also note that they may enrol for the Department's courses SLA 205, 206, 207, 208 (elementary Czech, Polish, Serbo-Croatian, Ukrainian), and also the courses SLA 215, 216, 217, 218 (Czech and Slovak, Polish, Serbo-Croatian, Ukrainian literature and culture). Not all of these courses are offered in every year, so students planning to take them should consult the "Schedule" included in the Department's list of courses, and make their plans accordingly. Students with such a language proficiency in Ukrainian as to be exempted from Advanced Ukrainian (SLA 308) may petition to take in their First Year the Fourth Year literature course in Ukrainian literature (SLA 408, SLA 418, or SLA 419). Only one will be offered each year thus allowing a student to choose a Ukrainian literature course as an option for every year of study at the University.

Students who propose to study Russian and a second, non-Slavic language, with a view to teaching in the secondary schools, should enrol in a programme representing specialization in Modern Languages and Literatures from their Second Year. Qualified students in Modern Languages and Literatures have the opportunity to spend their Third Year abroad at a university or universities recommended by the appropriate departments.

The student whose interest in the Russian or East European world is political, historical or sociological can specialize in Political Science, History, or Sociology and at the same time take language courses, and perhaps selected courses in literature, in this Department. Students planning to specialize in Economics, for example, or in Psychology, Mathematics or any number of other fields, who have a special interest in the Russian or East European area, will find an advanced knowledge of Russian or of another Slavic language an important intellectual and professional asset. In recent times many fields of research have included serious and extensive work in the Russian and East European area and in Russian and Asian studies. In academic fields such as history, political science, economics, sociology, professional careers can now be devoted to the study of some part of the Russian and East European areas. The growing importance of Eastern Europe in contemporary affairs has not only given great impetus to the growth of Slavic Studies in Western universities, but has the effect of making academic work in these areas especially lively and relevant. The study of literature, too, is invigorated by such contemporary relevance.

Students with literary interests, specializing in English or another modern language, will find profit in the study of Russian or another Slavic literature. Such students may also find attractive the opportunity of taking some important literary courses in Russian or other Slavic literatures *without needing a knowledge of any Slavic language.* (SLA 211, 212, 213, 215-218, 311, 312, 313, 316, 361, 362S, 363F, 364S.)

Graduate programmes in the Russian and Slavic areas have expanded widely in recent years, so that many opportunities exist for advanced study in North America and Europe. Many professional opportunities are now offered, especially in the academic world and in government service. There is certain to be a continuing need for specialists in these areas of Eastern Europe, to which not enough attention has been paid in the past, and which are today assuming a primary role in the world's intellectual, cultural, political and scientific affairs.

Students interested in Slavic programmes should consult with the Undergraduate Secretary who will give them more detailed information, direct them to the various departmental Counsellors as well as to the individual instructors of the Slavic courses.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- | | | |
|---------|---|---|
| SLA 100 | First Year Russian
Fundamentals of Russian grammar. Practice in aural comprehension, speaking, reading and writing. Offered only to students with little or no knowledge of the language. Other students please see course SLA 121. | 4L, 1P L1:MTWR9, L2:MTWR12, L3:MTWR2,
P1:F9, P2:F12, P3:F2 |
| SLA 121 | First Year Russian for Matriculants
Detailed study of more difficult areas of morphology; syntax: the simple sentence. Oral practice in laboratory and in class based on assigned reading and topics of current interest. Composition or translation, and lexico-grammatical analysis of selected texts. Extensive reading. Classes are conducted in Russian.
<i>Exclusion:</i> SLA 100/220
<i>Prerequisite:</i> Grade XIII Russian | 4S:MWF9, F1 |
| SLA 205 | Elementary Czech
Grammar, composition and conversation. Selected readings from Czech and Slovak authors. Offered only to students with little or no knowledge of the language. (Offered in alternate years.) | (Not offered 1973-74) 4S |

- SLA 206 **Elementary Polish** 4S:MTWR11
Grammar, composition and conversation. Regular language laboratory sessions. Selected readings of contemporary Polish texts. Offered only to students with little or no knowledge of the language. (Offered in alternate years.)
- SLA 207 **Elementary Serbo-Croatian** (Not offered 1973-74) 4S
Fundamentals of Serbo-Croatian Grammar with translation, composition, and some oral practice. Emphasis on reading knowledge. Offered only to students with little or no knowledge of the language. (Offered in alternate years.)
- SLA 208 **Elementary Ukrainian** 4S:MTWR11
Grammar, composition; emphasis on reading knowledge. Voluntary language laboratory for those wishing to practice in spoken Ukrainian. Offered only to students with little or no knowledge of the language. (Offered in alternate years.)
- SLA 211 **Masterworks of Russian Literature in Translation** 2L, 1T:MWF3
A study of major fictional and dramatic works by nineteenth and twentieth century Russian authors, including Pushkin, Gogol, Turgenev, Tolstoy, Dostoevsky, Gorky, Mayakovsky, Pasternak, Solzhenitsyn, and Nabokov. An examination of the stylistic range—from realism to the grotesque—and of the psychological, political and philosophical concerns of these writers.
- SLA 215 **Problems of Czech and Slovak Literatures and Cultures**
- SLA 216 **Problems of Polish Literature and Culture**
- SLA 217 **Problems of Serbo-Croatian Literature and Culture**
- SLA 218 **Problems of Ukrainian Literature and Culture**
- SLA 305 **Advanced Czech**
- SLA 306 **Advanced Polish**
- SLA 307 **Advanced Serbo-Croatian**
- SLA 308 **Advanced Ukrainian**

(These courses are described in the section which follows)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- SLA 212 **Russian Drama** 2L:TR12
A historical survey of the Russian theatre: origins, development of genres, relations with prose, poetry, and opera, impact on modern Western drama. Plays in translation from the classical (Fonvizin, Griboedov), romantic (Pushkin, Gogol), realistic (Ostrovsky), modernistic (Chekhov, Blok, Mayakovsky), and Soviet repertory.
- SLA 213 **Modern Slavic Drama in Translation** (Not offered 1973-74) 2S:TR12
The major trends of modernism in Slavic drama—symbolism, expressionism, and the theatre of the absurd: a comparative study of the structures, techniques, and themes of twentieth century plays from Czechoslovakia, Poland, Russia, Ukraine, and Yugoslavia.
- SLA 215 **Problems of Czech and Slovak Literatures and Cultures** 2L:TR10
Historical and cultural heritage and formation of a common State; national revival in the 19th century; place of intellectuals in the “First Republic” (1918-1938); national spirit, parochialism; universality in Czech and Slovak literatures; literature and freedom: spring and summer 1968. Reading in translation. (Offered in alternate years.)

- SLA 216 **Problems of Polish Literature and Culture** (Not offered 1973-74) 2S
Early developments; Renaissance and Baroque; 19th century literature: romantic poetry, realism in the novel; Young Poland; the re-establishment of the Polish state; contemporary Poland, 1945-60. Reading in translation. (Offered in alternate years.)
- SLA 217 **Problems of Serbo-Croatian Literature and Culture** 2S:TR10
Mediaeval period; Renaissance literature in Dubrovnik; folk literature; national revival and romanticism; realism and modernism before and after creation of the common state; contemporary trends. Reading in translation. (Offered in alternate years.)
- SLA 218 **Problems of Ukrainian Literature and Culture** (Not offered 1973-74) 2S
Mediaeval period; 16th and 17th centuries; Baroque; Classicism and Romanticism; Realism and Modernism: Ukraine between the two world wars; literature since World War II. Critical analysis of representative literary and oral works in translation. (Offered in alternate years.)
- SLA 220 **Second Year Russian** 4S S1:TWR9, S2:TWR2
Study of more difficult areas of morphology; syntax: the simple sentence. Extensive reading programme. Composition, translation and lexico-grammatical analysis of selected texts. Oral practice in laboratory and in class; conversation based on reading.
Exclusion: SLA 121/221
Prerequisite: SLA 100
- SLA 240 **The Nineteenth Century Russian Novel** 2L, 1T:MWF12
Major works by Pushkin, Gogol, Turgenev, Goncharov, Dostoevsky, Tolstoy and others. The development of the novel as a literary form: structural and thematic evolution; native and foreign influence—Romanticism and Realism. Readings mainly in translation. Required for specialists in Slavic Languages and Literatures.
Co- or prerequisite: SLA 220
- SLA 305 **Advanced Czech** 3S:MTW1, 1T:R1
Study of selected areas of morphology; syntax; composition and translation; oral practice. Selected texts, representing diverse styles, studied in the original Czech and Slovak. (Offered in alternate years.)
Prerequisite: SLA 205
- SLA 306 **Advanced Polish** 3L, 1P:MTWR1
Review of morphology. A study of syntax, word formation and selected literary texts (prose, poetry, literary criticism). Translation from English into Polish. Practice in oral comprehension: language laboratory sessions devoted to tapes of Polish radio broadcasts and of literary works. (Offered in alternate years.)
Prerequisite: SLA 206
- SLA 307 **Advanced Serbo-Croatian** 4S:MTWR1
Completion of morphology. Syntax of phrases, simple and compound sentences. Translation, composition, and oral practice based on extensive reading from Yugoslav authors. Emphasis on reading knowledge. (Offered in alternate years.)
Prerequisite: SLA 207
- SLA 308 **Advanced Ukrainian** 4S:MTWR1
A review of morphology and a study of syntax. Short compositions based on selected literary and critical texts. Voluntary language laboratory for those wishing practice in spoken Ukrainian. (Not offered 1974-75.)
Prerequisite: SLA 208

- SLA 311 **Slavic Civilization** 2S:TR12
The origins and prehistory of the Slavs; the material and spiritual culture of the early Slavs; the emergence of Slavic nationalities and their political, social and cultural development; the contribution of the Slavs to world culture and their role in history.
- SLA 312 **Tolstoy and Dostoevsky** 2S:TR3
A comparative study of the two novelists. Readings (in translation) will include, in additions to other writings, *War and Peace*, *Anna Karenina*, *Crime and Punishment* and *The Brothers Karamazov*.
- SLA 313 **The Russian and West European Novel in the 19th Century** 2S:TR11
The roots of Russian Realism in European Sentimentalism and Romanticism: the impact of such writers as Rouseau, Goethe, Byron, Constant, Scott, Hoffman and Sand on Karamzin, Pushkin, Lermontov and Gogol. The development of this legacy by Turgenev, Aksakov, Dostoevsky, Goncharov, Tolstoy, and Chernyshevsky. Comparative study of novels by these authors and works by Balzac, Stendhal, Flaubert, Dickens, George Eliot, James and Conrad. All reading may be done in translation.
- SLA 316 **Literature and Politics in the Soviet Union** 2S:TR1
The impact of literary theories and writers' organizations on literature. Origins and nature of political control of literature. Resistance to Party policies. Readings of literary and political material in translation. Lectures and oral reports.
Exclusion: SLA 446

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- SLA 320 **Third Year Russian** 3L:MWF10, 1P:T4
Continued study of grammar: syntax and especially difficult areas of morphology. Composition, translation and stylistic analysis of selected texts. Oral practice in class and in laboratory based on assigned readings. Extensive reading programme.
Exclusion: SLA 321
Prerequisite: SLA 220/121
- SLA 330 **Old Church Slavonic** 2S:TR12
Structure and history of Old Slavonic. Reading and linguistic study of Old Slavonic texts.
Prerequisite: SLA 121/220/205/206/207/208
- SLA 332 **Structure of Russian** 2S:TR2
Topics in the phonology, morphology, semantics and syntax of contemporary standard Russian.
Prerequisite: SLA 121/220
- SLA 340 **The Twentieth Century Russian Novel** 1L, 1T:TR10
Major trends in pre- and post-revolutionary Russian literature. Particular attention will be paid to Kuprin, Bunin, Andreev, Merezhkovsky, Bely and Sologub in the first term; and to Gorky, Zamyatin, Babel, Olesha, Leonov, Fadeev, Pasternak and Solzhenitsyn in the second term. Readings in the original and in translation. Required for Specialists in Russian and Slavic.
Co- or prerequisite: SLA 320
- SLA 341 **Russkaya literatura i byt v 19-m veke** (Not offered 1973-74) 2S
This course offers a selection from Russian literature of the 19th century with the emphasis on its origins in the ordinary life of the time. (Lectures in Russian.)
Prerequisite: SLA 220

- SLA 342 **Russkaya literatura i byt v 20-m veke** 2S:MW3
 This course offers a selection from Russian literature of the 20th century with the emphasis on its origins in the ordinary life of the time. (Lectures in Russian.)
Prerequisite: SLA 220
- SLA 361 **Modern Russian Religious Thought** 1L, 1T:TR3
 A survey of the principal themes of Russian religious and philosophical speculation from the eighteenth century to the present, based on a wide variety of works—literary, philosophical, and theological—by Chaadayev, Gogol, Khomiakov, Dostoevsky, Rozanov, Shestov, Tolstoy, Berdiaev, and others. All reading may be done in translation.
Exclusion: SLA 361F
- SLA 362S **Comparative Slavic Literature** (Not offered 1973-74) 2S
 Emphasis will be placed on the rise of nationalism in Russian, Ukrainian, Polish and Czech literatures of the 19th century. Readings in translation.
- SLA 363F **Solzhenitsyn's Moral Protest** 1L:M2, 1T:W2
 Aspects of Solzhenitsyn's craftsmanship will be examined, but the main emphasis will be placed on his critique of contemporary Soviet reality and on his interest in moral problems of a more universal nature. The inadequate treatment of Solzhenitsyn's works by Soviet ideologists and Western literary critics will also be considered. Reading will be in translation.
- SLA 364S **Turgenev** 1L:M2, 1T:W2
 Reading of main prose works in English translation. Literary fortunes in Russia and international fame.

COURSES OPEN TO FOURTH-YEAR STUDENTS

- SLA 405 **Studies in Czech and Slovak Literatures** 2S:W9-11
 The works of some of the following nineteenth and twentieth century authors. Czech: Macha, Erben, Nemcova, Havlicek, Neruda, Kirasek, Rais, Vrchlicky, Sladek, Biezina, Salda, K. Capek, Vancura, Hasek, Hostovsky, Olbracht, Nezval, Seifert, Halas, Holan, Hora, Hrubin, Deml, Holub, Hrabal, Skvorecky, Kundera. Slovak: Kral, Hvizdoslav, Krasko, Novomesky, Bednar, Valek, Stacho, Sikula.
Prerequisite: SLA 305
- SLA 406 **Studies in Polish Literature** 2S:W9-11
 The development of Polish drama from the Romantics to the present. Texts in Polish, secondary sources in Polish and English. (Not offered every year.)
Prerequisite: SLA 306
- SLA 407 **Studies in Serbo-Croatian Literature** 2S:W9-11
 A survey of major trends and authors in Serbo-Croatian literature from its beginnings to the present day. Reading in the original and in translation.
Prerequisite: SLA 307
- SLA 408 **Studies in the Ukrainian Short Story** 2S:W9-11
 The survey of the development of the short story from Kvitka-Osnovyanenko to the present day. All reading in the original. (Not offered every year.)
Prerequisite: SLA 308

- SLA 416 **Studies in Polish Poetry and Prose** (Not offered 1973-74) 2S
The survey of the most representative poets and prose-writers in the 19th and 20th century. Texts in Polish, secondary sources in Polish and English. (Not offered every year.)
Prerequisite: SLA 306
- SLA 418 **Studies in Ukrainian Drama** (Not offered 1973-74) 2S
The survey of the development of Ukrainian drama from Kotlyarevsky to the present day. All reading in the original. (Not offered every year.)
Prerequisite: SLA 308
- SLA 419 **Studies in Ukrainian Poetry** (Not offered 1973-74) 2S
The survey of Ukrainian poetry from Skovoroda to the present day. All reading in the original. (Not offered every year.)
Prerequisite: SLA 308
- SLA 420 **Advanced Russian Composition and Conversation** 3S:MWF12
Continued study of syntax. Detailed analysis of selected texts, and exercises in practical stylistics. Composition, precis and critical evaluation of literary works and articles (in Russian). Extensive reading and translation of fiction and non-fiction. Oral reports followed by discussion.
Exclusion: SLA 321/421
Prerequisite: SLA 320
- SLA 421 **Advanced Russian for Matriculants** 3S:MWF11
Programme similar to SLA 420, but designed for matriculants, i.e., a more advanced level of composition, translation, oral practice, etc. Conducted in Russian.
Exclusion: SLA 420
Prerequisite: SLA 321
- SLA 430 **History of the Russian Language** 2S:TR10
Topics in the historical phonology, morphology, semantics and syntax of Russian. Reading and linguistic study of Old Russian texts.
Prerequisite: SLA 330
- SLA 431 **Comparative Historical Slavic Linguistics** 2S:TR9
Common Slavic phonology and morphology. Topics in the historical grammar of the Slavic Languages.
Co- or prerequisite: SLA 430
- SLA 440 **Russian Poetry 1820-1960** 3S:MWF2
An introduction, through their poetry, to the major Russian poets of the nineteenth and twentieth centuries: Pushkin, Lermontov, Tyutchev, Nekrasov, and Fet; Blok, Gumilev, Akhmatova, Esenin, Mayakovsky, and Pasternak. Readings in Russian. Emphasis will be placed on the stylistic and structural aspects.
Prerequisite: SLA 320/321/340
- SLA 442 **Old Russian Literature** (Not offered 1973-74) 1L, 2T
A survey of the literary heritage of mediaeval Russia, from Kievan Rus through the seventeenth century. Chronicles, military tales, epics, hagiography, sermons, and the *povest* (in their historical development.) Emphasis will be on the literary aspects of these monuments. Readings in Russian.
Prerequisite: SLA 320/321
Co-requisite: SLA 420/421, SLA 440

SLA 443 **Eighteenth Century Russian Literature**

1L:M1, 2T:F9-11

A survey of the literary events and personalities of the eighteenth century, a crucial period in the development of modern Russian literature. Evolution of the literary language, experiments in verse form, emergence of such genres as the ode, the fable, the epic and mock-epic, the drama and prose fiction.

Prerequisite: SLA 320/321

Co-requisite: SLA 420/421, SLA 440

SOC**SOCIOLOGY**

Chairman of Department:

Professor I.M. Zeitlin

Supervisor of Studies:

Professor J. Wayne

Departmental Advisers:

Professor J. Joyner

Professor R. Beals

Professor J. Simpson

Professor A. Smith

Enquiries:

Borden Building, Room 220 (928-3412)

Sociology seeks an understanding of the determinants and the patterns of human interaction. In contrast with Psychology, which deals mainly with the investigation of the behaviour of individuals, Sociology examines the web of social relationships among people. In contrast with Social Work, which is concerned with the application of findings of the Social Sciences through policy measures, Sociology seeks primarily to explain.

Of course, explanation has many links with practice. In so far as Sociology consists of a body of tested theory and reliable facts, it can contribute to an appreciation of the dilemmas confronting human beings in their effort to achieve and maintain the kind of society in which they would prefer to live. In a world where traditional explanations often prove unreliable, both as bases for understanding and as guides for action, Sociology constitutes a valuable source of knowledge. In turn, Sociology is influenced by current debates and the environment in which they occur. Many different factors affect the ways in which Sociologists identify problems and devise concepts and theories for their explanation.

Through the use of a variety of methods, Sociology asks how our ways of thinking, feeling, and acting are shaped by our social experience, how they came to be what they are, and how they are changed. The scope of sociological investigation ranges from the analysis of the behaviour of small groups to the study and the comparison of the development, functioning, and change of large social systems. It is concerned with Canadian society as well as with societies in such areas as Africa, Asia, or Latin America. Its subjects cover the sociologies of politics, religion, the family, mass media, art, urban life, crime, medicine, occupations, deviance, education, racial and ethnic groups, and so on. All are specialized parts of the study of human behaviour in its social context.

Knowledge of Sociology is helpful in pursuing a career in government, industry, education, the professions, journalism, politics, and, in fact, any career in which one must deal with other persons as members of human groups. A professional career in Sociology, however, requires advanced training beyond the undergraduate level.

The Department of Sociology offers a four-year programme in Sociology. Requirements for this programme are found elsewhere in this Calendar under the heading "Suggested Programmes of Study". Although there is no requirement that a student entering the four-year programme in Sociology must focus upon a particular area of interest, the Department is prepared to recommend, in consultation with the student, programmes which emphasize Canadian society, comparative social structure, interpersonal relations, political sociology, social and economic organization, urban sociology, or some other combination of courses. Students who wish to attain a four-year degree in Sociology should enrol in the Department at the beginning of their Third Year.

Many of the advanced courses in Sociology have prerequisites, especially basic theory and the logic and methods of research. Some courses require competence in statistics. For these reasons, any student considering advanced courses is urged to include SOC 200 or SOC 201 and SOC 203 or SOC 313 in his programme of studies. Some of these courses are required for the four-year programme.

Students planning graduate studies in Sociology are particularly advised to take these courses. The Department of Sociology provides for a high degree of student participation through its Departmental Assembly, a parity body, and various Departmental Committees. It is Departmental policy to have all courses evaluated by students each year.

More detailed descriptions of courses, together with preliminary bibliographies, may be obtained from the Department of Sociology after August 15th.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

NOTE: SOC 101 has several independent sections, each with different instructors, different formats, and different emphases. Each section is, however, intended to familiarize students with the basic principles and methods of sociology as applied to the study of human behaviour. No two of these sections may be combined in any degree programme. SOC 101 is *strongly recommended* as preparation for all other SOC courses. Instructors in subsequent courses will assume the student has the background knowledge provided by an introductory sociology course. More detailed descriptions for individual sections may be obtained from the Department of Sociology after August 15th.

- SOC 101 **Introduction to Sociology** 2L:MW1, ½T:N
 The basic principles and methods of sociology as applied to the study of human societies, focusing on the social sources of differing values and conceptions of reality, and the influence of these on such phenomena as the behaviour of individuals, patterns of relations among groups, and social stability and change.

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

NOTE: It is *strongly recommended* that students choose courses listed in the Calendar under the year in which they are enrolled. Second and third year students will be permitted to take courses in higher years only if space is available.

- SOC 200 **Introduction to Social Research** 2L:MW1, 1T:F1
 An exploration of how social observations are used to develop and test sociological ideas. Selected studies representing a variety of theoretical approaches and research techniques are critically examined to illustrate general principles of conceptualization, measurement, and explanation. *J.G. Reitz.*
Suggested prior course: SOC 101 (SOC 101-103 in 1971-72)
- SOC 201 **Social Statistics** 2L, 1P L1:M4-6, F1: L2;T4-6, F1
 An introduction to statistical procedures basic to contemporary sociological research: summary descriptive techniques, parameter estimates, parametric and non-parametric test of association, and parametric and non-parametric tests of significant difference. The utility of techniques within each of the above major divisions is discussed with reference to the unique character of social data. *R.W. Burnside.*
Exclusion: Statistics courses
Suggested prior courses: SOC 101 (SOC 101-103 in 1971-72)
- SOC 202 **Structure of Inter-Personal Relations** 2L:TR11, ½T:N
 The study of patterned relationships, social roles and social expectations which arise out of interactions among individuals. *R.A. Lucas.*
Prerequisite: SOC 101 (SOC 101-103 in 1971-72)
- SOC 203 **History of Social Theory** 2L, 1T:MWF2
 This course is concerned with the development of sociology and with the works of particular Sociologists whose concepts not only have historical interest but also have relevance to contemporary sociology. (May not ordinarily be combined with SOC 313 in any degree programme.)
Prerequisite: SOC 101 (SOC 101-103 in 1971-72)

- SOC 204 **Political Sociology** 2L:TR12, 1T:N
The relations of society to the state and an introduction to the social basis of political behaviour, voting, political parties and party systems, political movements and revolutions.
Prerequisite: SOC 101 (SOC 101-103 in 1971-72)
- SOC 205 **Urban Sociology** 2L, 1T:MWF3
Examines the city both as a significant development in world civilization and as a working mechanism guided by contemporary policies, and studies human behaviour in its multi-faceted relations with the urban environment. *W.M. Michelson.*
Prerequisite: SOC 101 (SOC 101-103) in 1971-72)
- REL 205 **Sociology of Culture and Religion**
(See REL 205 under "Religious Studies")
- SOC 206 **Comparative Social Structures** 2L:W4-6
The comparative method is applied to the study of processes and institutions in different societies with a view to developing more reliable knowledge of social structure. Students will engage in individual research projects in consultation with the instructor.
H. Cooperstock.
Prerequisite: One course in SOC or permission of the instructor
Co-requisite: SOC 200/201
- SOC 207 **Sociology of Occupations** 2S:TR1
The relation of man to his occupations in a changing society including such topics as the meaning of work, occupational choice and mobility, bureaucracies, and women and other minority groups in the labour force.
Prerequisite: SOC 101 (SOC 101-103 in 1971-72)
- SOC 209 **Technology and Social Change** 2L:M2-4, 1T:F12
An introduction to the Sociology of economic life with an emphasis on the changing relations between work and leisure in pre-industrial, industrial, and post-industrial societies. *W. Phillips.*
Suggested prior course: SOC 101 (SOC 101-103 in 1971-72)
- SOC 210 **Race and Ethnic Relations** 3L:M3, W3-5, 1T:N
Analysis of the impact of racial, ethnic, and linguistic heterogeneity on various economic processes, on the institutional and non-institutional access to political power, and on self conceptions, social attitudes, and personality characteristics. The formation, maintenance, and disappearance of ethnic communities will also be considered. *R. Breton.*
Prerequisite: One course in SOC
- SOC 211 **Sociology of Small Groups** 4P:TR4-6
An inductive introduction to interpersonal relations in group contexts, the structure and dynamics of small groups, and the development of group culture. The course will involve participation in and observation of several types of groups. *J.L. Turk.*
- SOC 212 **Deviant Behaviour** 2L:TR11, 1T:N
A sociological analysis of deviant behaviour which examines theories of its genesis, social definition, maintenance, control, and social consequences. *I.D. Currie.*
Prerequisite: SOC 101 (SOC 101-103 in 1971-72) or permission of instructor
- SOC 213 **The Canadian Mosaic** 2L:MW1, 1T:N
The focus of this course will be on the Canadian mosaic. Analysis will involve the study of immigrant and native groups, ethnic differentiation, regional disparities and other particularistic entities, with a view toward assessing the strengths and weaknesses of Canadian society. *M. Kelner.*
Prerequisite: SOC 101 (101-103 in 1971-72)

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

- SOC 301 **Social Inequality** 2L, 1T:MWF12
Examines theories of social inequality, its empirical forms and consequences, and the determinants of continuity and change of patterns of social inequality. *B. Baldus*.
Recommended preparation: SOC 200, SOC 203
Prerequisite: One course in SOC
- SOC 302 **Sociology of the Family** 3L:W7-10p.m.
An examination of the internal dynamics of families, how the dynamics are shaped by social and cultural contexts, and how individuals develop within families. These topics will be explored through seminar group presentations and individual papers. *N.W. Bell and J.L. Turk*.
- SOC 303 **Canadian Society** 2L:TR3
This course will undertake to examine the way in which Canadian Society developed and assumed its character of distinctiveness. The changing structure of Canadian Society will be analyzed, and its current features will be discussed.
Prerequisite: SOC 101 (SOC 101-103 in 1971/72)
- SOC 304 **Change and Conflict in Contemporary Society** 2L:M4-6
Among the questions to be considered in this course are: Is the structure of the middle class changing? What are the implications of automation for occupations? Are educational systems and the labour market integrated? What are the political consequences of loss of credibility in traditional institutions? What are some of the major patterns of conflict related to the generation gap? *E.B. Harvey*.
Prerequisite: One course in SOC
- SOC 305 **Sociology of Religion** 2L:R4-6, 1T:N
Outlines the sociological approach to the study of religion. Focuses on how religion emerges, becomes part of and influences social life. Special attention will be given to changes in contemporary religious behaviour in our society. *R.C. Beals*.
- SOC 306 **Sociology of Crime and Delinquency** 2L:TR10, 1T:N
A discussion of the emergence of definitions of crime and how they are applied and enforced. Special emphasis on the social background of the Canadian criminal law, the role of the police, courts, prisons, and other institutions of social control. Sociological explanations of crime and delinquency will be examined within the framework of legal institutions. *S. Cook*.
Prerequisite: SOC 101 (SOC 101-103 in 1971-72)
- SOC 307 **Sociology of Economic Development** 2L:TR11, 1T:N
The relation between sociological factors and economic development examined from a comparative perspective starting with the contributions of Marx and Engels, Durkheim, and Weber. Other topics include the role of elites, ideology, bureaucracy, education and the military, especially in emerging nations.
Suggested prior course: One of SOC 301, 209 or 203
- SOC 309 **Mass Communications** 2L:R4-6
The course will examine, in an interdisciplinary fashion, various theoretical and methodological approaches to the general problem of communication. Then, within the context of a mass society, an attempt will be made to assess the impact of various communication technologies on the individual and social levels. *P. Lorion*.

- SOC 311 Sociology of Education** 2L:R4-6
 Focuses on the relationship between education and society in comparative perspective; on the internal structure of education systems and on the educational consequences of different organizational arrangements; on the current controversies surrounding the function and structure of the university. *J.L. Lennards*.
Prerequisite: One course in SOC
- SOC 312 Population and Society** 2L:TR 2
 This course will consider two primary issues: What is an optimal population size or rate of growth, and what social, economic and cultural conditions led to a decreasing rate of population growth in "modern" societies? Extensive reading in social history and English literature will be required. *L. Tepperman*.
Prerequisite: One course in SOC or permission of instructor
- SOC 313 The Development of Sociological Theory** 2L, 1T:MWF11
 The development of sociological theory from the eighteenth century to contemporary times with special reference to Condorcet, Burke, Malthus, Comte, Mill, de Tocqueville, Marx, Weber, Durkheim, Pareto, Sorel, Michels, Veblen, Freud, and Parsons. *L.S. Feuer*.
Exclusion: SOC 203
Prerequisite: One course in SOC
- PHL 314S Philosophy of Social Science**
 (See PHL 314S under "Philosophy")
- SOC 315 Workshop in Urban Sociology** 4P:TR4-6
 An advanced workshop in urban sociological theory and practice, involving intensive work with empirical data, using Toronto as a laboratory. The course will be subdivided into a number of inquiries into different aspects of the dimensions of community. Enrolment limited to 15 students. *B. Wellman*.
Prerequisite: SOC 205/permission of instructor
Co-requisite: SOC 201/permission of instructor
- SOC 318 Quantitative Research Methods** 3L:MWF2
 A systems approach to quantitative sociological research: logical proofs through model construction, symbolic proofs through a formal system, empirical proofs through application of operational system. Topics treated within these systems include formalization and operationalization of theoretic constructs, experiment and field techniques, questionnaire-schedule design, and data analysis designs. Lab deals exclusively with computer techniques in social research. *R. W. Burnside*.
Suggested prerequisite/co-requisites: SOC 200, 313, 401
Prerequisite: A Statistics course and SOC 203/313
- SOC 319 Contemporary Chinese Social Structure** 2S:TR1
 An analysis of the institutions of state and society of China. The social structure of tradition, Republican, and Communist China will be compared. *J. Salaff*.
Prerequisite: One course in SOC or permission of the instructor
- SOC 320 Workshop in Applied Sociology** 2S:M9-11
 An exploration of the uses of sociology in solving social problems and planning alternative social structures. Applications in a wide range of areas, including poverty, crime, medicine, drug use, race and ethnic relations, industrial relations, education and politics, will be critically examined. General problems of application will be identified and analyzed. Enrolment limited to 20 students. *J.G. Reitz*.
Prerequisite: One course in SOC or permission of the instructor

- SOC 321 **Urbanization and Social Change** 2S:T4-6, 1T:N
 Models and theories of social change are developed and the role of cities in promoting social change is analyzed. Cases from the developed and newly-developing countries will be studied. *J. Wayne.*
Prerequisite: One course in urban studies, or one course in social change/development/modernization, in Sociology/Political Science/Economics/Geography
- SOC 322S **Workshop in Field Methods** 2S:M4-6
 This course will introduce to students several techniques used in field studies: participant observation, interviewing, questionnaire construction, writing field notes, analysis of qualitative data and problems of publication of field studies. Students will be organized into groups and carry out a number of studies in the field. Special attention will be paid to problems of "entry" into field settings and evaluation of results. Enrolment limited to 25 students. *P.K. New.*
- SOC 323 **Social Change in Latin America** (Not offered 1973-74) 2S
 Using both an historical and comparative perspective, this seminar will concentrate on the relationship between social and economic changes, the urban proletariat, elite groups and important institutions (e.g. the Church, the military, bureaucracy, education) in Latin America. The Brazilian Northeast will serve as one example and comparisons with other Latin and non-Latin societies will be made.
- SOC 324 **Canadian Social Science** 2L:W9-11
 The course will examine the history of social scientific thought in Canada. The focus will be on how the intellectual, political and social milieu have influenced the directions that such thought has taken. *D.W. Magill* and *J.L. Turk.*
Prerequisite: Two courses in SOC/POL/HIS and permission of instructors
- SOC 325 **Sociology of Health and Medicine** 2L:TR12, 1T:N
 This course will cover the organizational structure of different health facilities, the delivery of health care, and health manpower. Definition of health and illness by users, and pathways to health care providers will also be considered. Students will undertake independent projects, individually or in groups. *P.N. New.*
Prerequisite: Two SOC courses or permission of instructor
- SOC 328F **Seminar in Social Movements** 2S:W9-11
 One classic description of social movements refers to them as "collective enterprises to establish a new order of life". In this seminar, social movements will be examined sociologically and historically as complex forms of "collective behaviour". Participants in the seminar will be expected to examine theoretical perspectives on the phenomenon in terms of research into various kinds of historical and contemporary movements. *R. O'Toole.*
Prerequisite: Permission of instructor
- SOC 361 **Women in Society** 2S:T4-6
 The study of norms, values and sanctions surrounding the role of women in industrial society. Emphasis is placed on analyzing the impact of social expectations regarding women's role in society on fertility and labour force participation. Familiarity with the use of labour force or census data suggested. *J. Salaff.*
- SOC 362S **Youth and Society (Formerly SOC 464S)** 2L:W4-6
 This course will evaluate the sociological literature on youth. Particular attention will be given to (1) explanations for the rise of the "experiential counter-culture"; (2) historical patterns of behaviour; (3) the role of youth in social change. Enrolment limited to 30 students. *S. Cook.*
Prerequisite: One course in SOC

- SOC 390 Independent Research** N
Students, either individuals or as a group, who wish to explore in depth a subject in Sociology, should submit a specific proposal to a professor, or professors, not later than October 1st. Preference is given to students with at least Grade B+ standing in the Second Year. (Open only when a faculty member is willing and available to supervise.)
- SOC 391F Independent Research** N
Open only when a faculty member is willing and available to supervise. Preference is given to students with at least a grade B+ standing in Second Year.
- SOC 392S Independent Research** N
Open only when a faculty member is willing and available to supervise. Preference is given to students with at least a grade B+ standing in Second Year.

COURSES OPEN TO FOURTH-YEAR STUDENTS

NOTE: All students wishing to enrol in fourth-year courses are required to enrol with the Department in addition to their regular registration. Departmental enrolment takes place during the official registration period.

- SOC 401 Systematic Sociological Theory** 2L:T9-11
An examination of the nature of explanation and theory, and critical analyses of the work of selected "theorists" and of approaches to theorizing in Sociology. Primary emphasis is on the critical analysis of the conceptual and logical structure of theories in sociology. *A.H. Smith.*
Prerequisite: At least two courses in SOC at the 200/300 level/permission of instructor
- SOC 402 Workshop in Comparative Studies** 2P:N
The emphasis of the course is on the comparative study of social issues, such as economic and political development, social stratification and mobility, and changes in kinship and family. Selected historical and cross-cultural studies will be analyzed with a view to developing alternate strategies for choosing appropriate comparative data in each case. Enrolment limited to 20 students.
Exclusion: SOC 316 in 1971-72
Prerequisite: At least two courses in SOC at the 200/300 level and permission of the instructor
- SOC 404F Soviet Society: Social Structure and Social Change** 2S:T9-11
A study of Soviet industrialization and its impact on social institutions. Topics will include the sequencing of change, the relationship between social change and social control, the impact of planning, social stratification and mobility, ethnic relations, science and education, deviance. Current Soviet sociological research will be considered along with Western studies. Research may be continued as SOC 492S in spring. *P.H. Solomon.*
Prerequisite: Two courses in SOC/permission of instructor
- SOC 405S Ethnomethodology** 2S:TR1
An introduction to ethnomethodology. The course will examine the nature of ethnomethodology, cite its philosophical roots, critically evaluate current work, and discuss its implications for sociology. The work of Garfinkel and Cicourel will receive particular attention. *J.L. Turk.*
Prerequisite: Permission of instructor

SOC 407S Seminar on the Sociology of Higher Education 2S:M4-6
 A detailed examination of the functioning and structure of institutions of higher education in comparative perspective. Topics to be considered: differences between the Canadian and American systems of higher education, undergraduate education past and present, faculty orientations and their structural sources, problems of university governance, student discontent and its relationship to the university structure, alternative structures of higher education. Enrolment limited to 20 students. *J.L. Lennards*.
Prerequisite: At least two courses in SOC at the 200/300 level and permission of instructor

REL 416F Religion and Alienation

REL 417S The Changing Concept of Secularization

(See REL 416F and 417S under "Religious Studies")

SOC 461F Sociology of Ameliorative Institutions 2L:W9-11
 This seminar explores the use of institutions (closed) by western societies for the "criminal," "insane," and "dependent." The structure and perceived function of these institutions are treated with reference to the then current theories and beliefs about deviance. The individual and his response to incarceration in the present time is also considered. Enrolment limited to 20 students. *R.W. Burnside*.
Prerequisite: Any two SOC 202, 208, 212, 306, 314, 473S/permission of instructor

SOC 462F The Sociological Study of Motivation 2S:N
 A comparison of the symbolic interactionist approach to human interaction with those more common in sociology and social psychology. Main theme: how "consciousness" (i.e., the actor's definition or perception of the situation) affects his behaviour and how it should be studied. Enrolment limited to 15 students. *L. Zakuta*.
Prerequisites: 4 previous courses in sociology/social psychology and permission of instructor

SOC 490 Independent Research N
 Open only when a faculty member is willing and available to supervise, with preference to students with at least Grade B+ standing in the Third Year.

SOC 491F Independent Research N
 Open only when a Faculty member is willing and available to supervise, with preference to students with at least Grade B+ standing in Third Year.

SOC 492S Independent Research N
 Open only when a Faculty member is willing and available to supervise, with preference to students with at least Grade B+ standing in Third Year.

TURKISH - See "Islamic Studies" (ISL)

UKRAINIAN - See "Slavic Languages and Literatures" (SLA)

SPA

SPANISH

Given by the staff of the Department of Hispanic Studies

See also PRT

<i>Chairman of Department:</i>	Professor G.L. Stagg
<i>Undergraduate Secretary:</i>	Professor M.E. Rugg
<i>Enquiries:</i>	21 Sussex Avenue, Room 224 (928-3357)

Hispanic culture offers a variety probably unrivalled by any other modern western culture. In the Middle Ages, Spain was the vital point of contact of the Christian, Jewish and Islamic civilizations;

in its Golden Age it led the way in the exploration and settlement of the New World, and established a great empire in the process; today it is estimated that the Spanish language is the third most widely-spoken in the world.

The subject "Spanish" is mainly, but by no means exclusively, concerned with the language and literature of the Spanish-speaking peoples. Courses are offered for beginners in the language, as well as for those with Grade XIII standing or equivalent. Stress is laid on both the spoken and written language, and opportunities are provided for practice in each year. In the First Year, beginners receive an intensive course including work in the language laboratory (SPA 100), while those with Grade XIII standing read selected works of modern Spanish literature, as well as continuing their study of the language (SPA 120). Of the two additional courses, both open to each group of students, one (SPA 150) provides a survey of the social, artistic and intellectual history of Spain; the other (SPA 125) investigates the history, structure and lexical content of the Spanish language.

In the Second Year, a student in Spanish takes the core course (SPA 220) or half-course (SPA 221Y) of language practice. He may, if he chooses, also take half-courses in phonetics and phonemics, modern Spanish Literature, and Spanish American Civilization.

Second-Year students who do not wish to specialize in Spanish may continue with the intermediate language and reading offered in SPA 200. A continuation of SPA 200 will be found in SPA 300.

In addition to the third-year core course (SPA 320) and its fourth-year counterpart (SPA 420Y), which consist of advanced language practice, students may take any of the other half-courses in the 300- and 400-series, subject to the approval of the Department. Courses are offered in mediaeval Spanish literature, prose, verse and drama of the Golden Age and Modern periods, history of the language, Spanish-American novel, short story, essay, poetry and drama. In all years, outstanding literary works are read not only for their individual artistic value, but also as illustrations of the outlook and the intellectual climate of their age. Group discussions and the preparation of reports and essays are important means to this end.

Opportunities for qualified teachers of Spanish and another language exist in the high schools of Ontario. At the university level, there are opportunities for teachers of Spanish language and literature. In addition, the study of Spanish, as of other modern languages, may prepare students for such careers as the foreign service, publishing, journalism, and commercial and cultural relations between Canada and Spanish-speaking countries. The development of closer Canadian relations with Spain and Latin America will extend the range of available opportunities.

Requirements for programmes leading to the Type A course at The Faculty of Education will be found in this Calendar under "Suggested Programmes of Study."

Spanish and Portuguese may be combined with courses in Anthropology, Geography, History, Political Economy and Sociology in an interdisciplinary programme of Latin American Studies. This programme provides a thorough grounding in the Spanish and Portuguese languages and an introduction to the literature, history and culture of Latin America. For the suggested course of study, see Latin American Studies under the heading "Suggested Programmes of Study."

For counselling in Spanish courses, students may consult Professor M.E. Rugg (928-3358).

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

NOTE: Students with an adequate knowledge of Spanish may be required to substitute another Spanish option for the language course or half-course in any year.

SPA 100 **Spanish Language for Beginners** 3L, 2P
 MVL1:MWF9, IMTL2:MWF10, NUVL3:MWF11, MUVL4:MWF12, VL5:MWF2,
 MVP1:TR9, IMTP2:TR10, NUVP3:TR11, MUVP4:TR12, VP5:TR2
 L6:R6.30-9.30p.m.P6:EVE

A basic introductory course which provides instruction in the spoken and written language. In addition to the three hours of classes in small groups, two hours of supervised instruction in the language laboratory afford the student an opportunity for intensive oral practice. The second term includes a study of leading contemporary authors of the Spanish-speaking world. (May not be taken by students with XIII SPA or whose knowledge of Spanish is equivalent to or better than that required for XIII SPA).

Exclusion: SPA 120

- SPA 120 Modern Spanish Literature, Language Practice** 3L, 1T L1:MWF9, L2:MWF11, L3:MWF2, T:T9/R9/R11/R1/R2/T11/T1
A course for those with Grade XIII standing or equivalent in the subject. Selected prose and poetic works of modern Spain and Spanish America are read and discussed in relation to literary, social and intellectual problems. Intensive written and oral practice is stressed both in the two hours of literature and in the language hours. Note: Students with a double credit in XIII SPA should consult the Department about suitable courses.
Exclusion: SPA 100
Prerequisite: XIII SPA
- SPA 125 Introductory Spanish Linguistics. Language Problems** 2L:TR11
Introduction and theoretical background to the study of Hispanic linguistics. Brief history of the Spanish language, its sound system, lexical components, grammatical structure, comparison of its structure with that of Latin, other Romance languages and English. Second term: problems of learning Spanish and study of its basic vocabulary.
Co-requisite: SPA 100/120
- SPA 150 Survey of Spanish Culture** 1L:F1, 1T:T1/W3/R10
An examination of the social, political, intellectual and artistic history of Peninsular Spain from pre-Roman times to the present. Slides, music and other illustrative material will be utilized as aids in emphasizing the outstanding features of the important periods in Spanish culture. Lectures and prescribed reading will be in English.
- SPA 195Z Reading Course in Spanish** 1S:W1
A non-credit course for graduate and undergraduate students in any Faculty.
- COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS**
- SPA 200 Intermediate Spanish** 2L, 1T L1:MW1, L2:M7.30-9.30p.m., T:N
The reading of some works of modern Hispanic literature; composition and oral practice. This course may not be counted towards a specialist or a double specialist programme.
Exclusion: SPA 220/221Y
Prerequisite: SPA 100/XIII SPA
- SPA 220 Composition and Oral Practice I** 2L, 1T L1:MW1, L2:TR9, L3:TR11, L4:TR1, L5:M7.30-9.30p.m., 1T:T11/T2/W1/T9/R11/R1/R10/W10
This course is designed to give the student intensive practice in the language, both written and oral, to enable him to gain ease and fluency in both skills. The division into small groups will allow the instructor to give individual attention.
Exclusion: SPA 200/221Y
Prerequisite: SPA 100
- SPA 221Y Composition and Oral Practice II** 1L, 1T L1:T11, L2:R11, L3:M1, L4:W1, 1T:T11/R11/W1/M1
This course will give the intermediate student intensive practice in written and oral Spanish. Small groups in composition and oral classes will ensure individual attention.
Exclusion: SPA 200/220
Prerequisite: SPA 120
- SPA 225Y Spanish Phonetics and Phonemics** 1L, ½T:TR12
After an introduction to general phonetic theory, a detailed study of the sounds of contemporary Spanish will lead to a discussion of the way these sounds function in the phonemic system of the language.
Prerequisite: SPA 100/120
Co-requisite: SPA 220/221Y

- SPA 236S **Spanish Poetry from 1830 to 1930** 3L L1:MWF9, L2:MWF11
 A study of some major poets of the nineteenth and twentieth centuries showing successive changes in poetic style and in the treatment of reality from Romanticism to Surrealism. The lecture period in English/Spanish will be supplemented by seminar discussion of poems in Spanish for additional oral practice.
Prerequisite: SPA 100/120
Co-requisite: SPA 220/221Y
- SPA 236Y **Spanish Poetry from 1830 to 1930** 1L, ½T:W7.30-9.30p.m.
 The same as SPA 236S.
- SPA 246F **Spanish Drama from 1830 to 1930** 2L, 1T L1, T1:MWF9, L2, T2:MWF11
 L3:W7.30-9.30p.m.
 The Romantic revolt against Neo-Classicism; the Realistic theatre's presentation of moral and social questions; later trends toward discussion of philosophical and psychological problems.
Prerequisite: SPA 100/120
Co-requisite: SPA 220/221Y
- SPA 256Y **The Modern Spanish Novel** 1L, ½T L1, T1:TR10, L2, T2:TR2
 The development of the Spanish novel studied in representative works of major novelists from Romanticism to the Civil War (1936-39).
Prerequisite: SPA 100/120
Co-requisite: SPA 220/221Y
- SPA 280Y **Spanish American Civilization** 1L, ½T L1:TR11, L2:TR3
 Significant cultural manifestations in Latin America, from the pre-Columbian civilizations to the present, will be examined using background texts and specific literary works. A lecture-discussion period, conducted in Spanish, will be supplemented by a seminar hour designed to improve oral proficiency in Spanish.
Prerequisite: SPA 100/120
Co-requisite: SPA 220/221Y

COURSES OPEN TO THIRD- AND HIGHER-YEAR STUDENTS

NOTE: All courses in the 300 and 400 series (except SPA 420Y) may be taken in Third or Fourth Year, but the choice of option is subject to the approval of the Department.

- SPA 300 **Advanced Spanish** 2L:MW1, 1T:N
 Realism in Hispanic literature from the picaresque novel to the nineteenth century: the reading of some outstanding works; composition and oral practice. This course may not be counted towards a specialist or a double specialist programme.
Prerequisite: SPA 200/220
- SPA320 **Composition and Oral Practice III**
 2L, 1T L1:MW12, L2: TR1, L3: TR2, L4:M7-9.30p.m., 1T:R9/R2/W1/W9/W2/F1
 This course provides, in small groups, intensive practice in written and oral Spanish for the advanced student.
Exclusion: SPA 300
Prerequisite: SPA 220/221Y
- SPA 350 **Golden Age Literature** 3L L1:MWF11, L2:R7.30-9.30p.m.
 A study of sixteenth and seventeenth-century Spanish Drama (stressing stage presentation); prose fiction (different types such as the chivalresque, pastoral, picaresque, with particular attention to *Don Quijote*); and the major Renaissance and Baroque poets.
Exclusion: SPA 300/any two or three of SPA 333F, 343Y, 353Y
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y

- SPA 356Y **Contemporary Fiction and its Backgrounds** 2L, 1T:MWF12
 (See Interdisciplinary Literature Courses: INL 312.) Students wishing to obtain a half-course credit toward a specialist programme in Spanish must satisfy the prerequisite and co-requisite requirements stated below and any other requirements set by the Instructor.
Exclusion: INL 312
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 380F **Spanish American Literature from 1500 to 1880** 2L:T7.30-9.30p.m.
 Literary currents of the colonial period and the nineteenth century prior to *modernismo*: the growth of cultural self-expression.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 381S **Spanish American Literature from 1880 to the Present** 2L, 1T:MWF12
 Designed for non-specialists and specialists alike, this course explores the most significant trends in Spanish American literature since 1880. Basic concepts will be illustrated by a study of exemplary works from all major genres (novel, drama, short story, poetry and essay).
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 420Y **Composition and Oral Practice IV** 1L, 1T L1:T10, L2:T2, L3:M7-9.30p.m.,
 T:R10/R2/R12/EVE
 A course designed to provide fluency in the language, both at the literary and colloquial level, with intensive written and oral practice in small groups. This course is open only to Fourth-Year students, who may substitute another Spanish option for it, subject to the approval of the Department.
Prerequisite: SPA 320Y
- SPA 425Y **History of the Spanish Language** 1L, ½T:TR1
 The evolution of Spanish from Pre-Romanic times to the present. The main aspects to be treated are: the dialectalization of Hispano-Latin through inherent linguistic changes and influences from other languages, and the development of Castilian from a dialect in the mediaeval period into one of the most important languages of the world in modern times.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 430F **Mediaeval Spanish Verse** 2L, 1T:MWF10
 The development of epic poetry from the *Cid* to the *romances*. The mozarabic *jarchyas* and the origins of the lyric poetry of love. The *mester de clerecía*, the “*bizantine*” matter, and the *Libro de Buen Amor*. The *literatura de protesta* and other committed poetry. Fifteenth century allegorical lyric and epic.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 436S **Spanish Poetry since 1930** 3L:MWF1
 A study of some major poets and poetics of the twentieth century. The lectures will be in Spanish, supplemented by oral and written analysis of selected poems in the tutorial groups.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y

- SPA 446S **Spanish Drama since 1930** 2L, 1T:MWF9
 Naturalism and sentiment in the middle-class comedy of manners; the influence of "Modernism", the experimental techniques in the *teatro de vanguardia* and the influence of the expressionistic and grotesque theatres; the escape from reality and the theatre of the absurd; recent trends in themes of social protest.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 450S **Mediaeval Spanish Literary Prose** 2L, 1T:MWF10
 The novelistic and epic elements of the early chronicles. Spain as point of departure for the development of the oriental frame story and *literatura de ejemplos*. The early *novelas caballerescas*. The origin of the allegorical and sentimental novel. The mediaeval aspects of the first *Celestina*.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 456Y **Studies of Major Modern Spanish Novelists** 2L:W7.30-9.30p.m.
 An intensive study of the principal Spanish contributions to the European novel in the nineteenth and twentieth centuries.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 461F **Spanish American Modernista Verse** 2L, 1T:MWF2
 Spanish America's attempts to free itself from dependence on Spanish literary norms and to find its own identity are studied in the works of outstanding exponents of Modernism, the first truly original movement in Hispanic American literature (1880-1920).
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 466S **Spanish American Verse since Modernismo** 2L, 1T:MWF2
 A study of the different currents in twentieth century Spanish American verse with specific reference to their outstanding exponents.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 470S **Modern Spanish American Drama** 2L, 1T:MWF1
 A study of the dramatic genre as reflected in some of its significant exponents.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 482F **Twentieth Century Spanish American Novel** 2L, 1T:MWF1
 Representative works, including the *novela gauchesca*, the *novela indianista*, and the *novela de la revolución mexicana*.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 484S **Modern Spanish American Cuento** 2L:T7.30-9.30p.m.
 Representative works from the short story genre in the nineteenth and twentieth centuries, including Borges, Cortázar, Rulfo and others.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y
- SPA 486F **Spanish American Essay** (Not offered 1973-74)
 A study of the search by modern essayists for the spiritual essence of Spanish America in an age of growing materialism and cultural upheaval.
Prerequisite: SPA 220/221Y
Co-requisite: SPA 320/420Y

Given by the staff of the Department of Mathematics

See also ACT, APM, MAT

Students should refer to the essay published under "Mathematics"

- STA 222 General Statistics** 2L, 2T L1:WF3, L2:TR12, T1:M1-3, T2:M2-4, T3:M3-5
 Graphs, averages, frequency distributions, elements of probability theory, tests of significance, analysis of variance, regression, applications.
Exclusion: ECO 220, GGR 270/271, GLG 221Y, SOC 201, STA 232, 252
Prerequisite: XII MAT (Not open to First-Year Students)
- STA 232 Introduction to Statistics** 2L:WF3, 1T:M3
 Elements of probability theory, standard distributions, sampling, significance tests and confidence intervals, least squares, analysis of variance, introduction to the design of experiments and sample surveys.
Exclusion: ECO 220, GGR 270/271, GLG 221Y, SOC 201, STA 222, 252
Prerequisite: MAT 130/134/135/139/150
- STA 252 Probability and Statistics** 2L, 1T:MWF3
 Probability spaces and distributions on R^1 and R^n ; marginal probability, independence and distributions on product spaces; expectation; sequences of random variables. Inference from symmetry and large sample theory; parametric models and related estimation and testing; variation response models; regression analysis and experimental design.
Exclusion: ECO 220, GGR 270/271, GLG 221Y, SOC 201, STA 222, 232
Prerequisite: MAT 139/150
Co-requisite: MAT 140/224F
- STA 332F Experimental Design** 2L, 1T:TR12, F1
 The statistical aspects of collecting and analyzing experimental data; analysis of variance, orthogonal designs.
Prerequisite: STA 232/252
- STA 342S Regression Analysis** 2L, 1T:TR12, F1
 Regression theory with applications to the analysis of non-orthogonal data.
Prerequisite: STA 332F/252 (Recommended preparation: MAT 140/225)
- STA 347S Probability and Applications** 2L, 1T:TRF1
 Probability theory (extending elementary results) especially conditional probability, random variables (multi-dimensional), characteristic functions, law of large numbers. Introduction to stochastic processes with a selection from the following topics: Markov chains (discrete or continuous time), renewal theory, covariance stationary processes, turbulence and noise.
Exclusion: STA 357
Prerequisite: STA 232/252 and MAT 239/250/319S
- STA 352 Mathematical Statistics** 2L:MW4, 1T:N
 Continuation of STA 252. Distribution theory. Inference theory: likelihood, classical, decision theoretic, Bayesian. Elements of multivariate and distribution-free statistics.
Prerequisite: STA 252
- STA 357 Probability** 2L, 1T:TRF1
 A thorough treatment of joint probability distributions, sequences of random variables, sums of independent random variables, generating functions, law of large numbers and central limit theorem, introduction to Markov chains, and other topics of student interest.
Exclusion: STA 347S
Prerequisite: STA 252 and MAT 239/250

- STA 447F **Probability Theory** 2L, 1T:MWF2
 Primarily a theoretical course, the emphasis being on limit theorems such as the strong law of large numbers and the convergence of sums of random variables. Students with an interest in measure theory are advised that the study of probability offers an example of its application.
Reference: Feller, *An Introduction to Probability Theory and Its Applications Vol. 1 & 2*
Prerequisite: STA 357
Co-requisite: MAT 350
- STA 452F **Advanced Statistics** 2L:TR2, 1T:F1
 One or more topics in statistics to be selected from: experimental design, sequential procedures, non-parametric methods, multivariate analysis, foundations of statistics.
Prerequisite: STA 352
- STA 457S **Time Series Analysis** 2L, 1T:MWF2
 This course is an introduction to the theory of stationary processes. Topics to be covered include: a discussion of mathematical prerequisites, harmonic analysis of weakly stationary processes, and prediction theory.
Prerequisite: STA 357
- STA 472F/477S/497 **Advanced Topics** 2L, 1T:N
 A graduate level course in Probability or Statistics.
Co-requisites: Three other 400-level courses in mathematics: consent of the Instructor and the Undergraduate Secretary of the Department is required.

SYRIAC - See NES "Near Eastern Studies"

TRINITY COLLEGE COURSES - See INT

UNIVERSITY COLLEGE COURSES - See INU

VICTORIA COLLEGE COURSES - See INV

YIDDISH - See ANT "Anthropology"

ZOO

ZOOLOGY

<i>Chairman of Department:</i>	Professor D.A. Chant
<i>Associate Chairman:</i>	Professor R.R. Langford
<i>Undergraduate Secretary:</i>	Professor J.B. Falls
<i>Student Counselling Service:</i>	928-8879
<i>Enquiries:</i>	Ramsay Wright Building, Room 426 (928-8879)

Zoology is the branch of the biological sciences concerned with the animal kingdom, and thus provides a broad perspective of man's place in the natural world. Historically, Zoology was largely an observational science, but now has become more experimental and theoretical and depends in its research on the modern principles of mathematics and the physical sciences. The main theoretical contributions of zoologists have been in the understanding of life in terms of physical and chemical mechanisms, and the theory of organic evolution.

Basic awareness of the population explosion and its consequences have come from Zoological research. Ecological studies of the interaction of plants and animals with their environments provide insights into such human problems as famine, disease, and pollution, and also provide a basis for the management of biological resources, such as fisheries and natural areas for recreation. Zoology plays

a part not only in the study of life-support systems on our planet, but also for space travel. One modern aspect of Zoology is animal behaviour, the study of which helps us to understand human behaviour in warfare, politics, and other activities. Zoologists study the effects of radiation on animals and their surroundings, and formulate rules that can be applied to man. Much of the research done in medicine depends on discoveries made with other animals and applied to man. Many agricultural fields, such as veterinary medicine and economic entomology, also depend on Zoological research.

A Zoologist is a scientist who is engaged in the study of the structure, functioning, and inter-relationships among animals. The general field of Zoology is divided into a large number of special areas of study and research. Zoology may be divided on the basis of the classification of animals, including Protozoology, Entomology, Mammalogy, and Ichthyology. Another way is to divide it by levels of organization and/or methods of study, such as Molecular Biology, Cell Biology, Morphology, Physiology, Genetics, Ethology, and Population Biology.

Modern Zoology depends on knowledge in many other scientific disciplines. The fruitful interaction of Zoology with the other sciences is encouraged at the University of Toronto. Special branches of Zoology can be combined with studies in other fields, such as Anthropology, Botany, Geology, Hygiene (including Microbiology and Parasitology), Mathematics, Medical Biophysics, Medicine (including Anatomy, Biochemistry, and Physiology) and Psychology. Many of the professors in the Department of Zoology do research and teach in other departments of the University to which they are cross-appointed. Members of the Zoology Department also maintain active programmes in affiliation with the Royal Ontario Museum, the Institute of Environmental Sciences and Engineering, the Ontario Ministry of Natural Resources, and the Fisheries Research Board of Canada, to mention but a few associations. The relationships and opportunities for research and study between different disciplines are constantly being investigated and extended.

Careers in Zoology are mainly in research, seeking new knowledge on which to base our understanding of biological principles; in teaching in secondary schools, community colleges, and universities; and in technical work such as drug testing, pest control, fish and wildlife management, and animal production. Zoologists are chiefly employed by government departments concerned with natural resources, by research institutes and medical laboratories and by educational institutions. A few are employed in resource industries, pharmaceutical laboratories, and other areas. Professional careers in Zoology require specialization at the undergraduate level, and usually an advanced degree. Students should bear this in mind when planning their programmes.

Two types of courses are offered by the Department of Zoology: (1) Generalist courses (ZOO 200-201), primarily for the student who either does not wish to specialize in any discipline or who wishes to specialize in a discipline other than Zoology yet include some Zoology in his programme. These generalist courses cover a broad area and stress the relationship of special aspects of Zoology to other human activities. Even if a student does not seek to specialize in Zoology, he may enrol in any of the specialized courses.

(2) Specialized courses (ZOO 211 and higher numbers), primarily for the student who wishes to specialize in Zoology or Biology. These courses deal directly with the subject, and its relationship to other disciplines is not stressed. The student specializing in Zoology or Biology may also take general Zoology courses in order to broaden his background in the Life Sciences, and to study their relationship to other disciplines.

In making a selection of Zoology and other science courses in a given year, the student should ensure that prerequisites for courses to be taken with other departments in higher years are obtained.

There is no prescribed programme for students who wish to specialize in and prepare for a career in Zoology. However, such students are advised to build their programmes along the lines shown under Zoology in the section of this *Calendar* entitled "B.Sc. Programmes".

Many variations on the suggested programme are possible, depending on the student's individual interests and needs. For example, a student with broad interests in Ecology may wish to take courses in Environment (see Interdisciplinary Courses); one interested in Quantitative Ecology may wish to take additional courses in Mathematics (see Programme in Mathematics and Biology); one interested broadly in Biology may wish to substitute courses in Botany for some of those suggested (see Programme in Biology); or one interested in Cellular Zoology or Physiology may wish to take more Chemistry, Physics, or Biochemistry than the suggested minimum. Specialist students are urged to take advantage of the counselling services provided by the Department before selecting courses for their programmes.

ZOO 200 and 201 are available to any student in the University in any year. Students entering university with Grade XIII Biology may be allowed to enrol directly in other Zoology courses which are primarily for students in second or higher years. Normally, however, they will be advised to take BIO 110 to ensure an adequate background for further studies in the Life Sciences.

Prerequisites and co-requisites for all Zoology courses are suggested, not required, but course content will be based on the assumption that students have a background equivalent to that implied by these recommendations. Enrolment may have to be limited in some courses due to problems of space and equipment. In such cases, the professor in charge will, during the first week, determine who can be admitted on the basis of the students' preparation and needs. The Department considers this arrangement fairer than a first-come, first-served system.

The Department maintains an undergraduate office (Room 426, 928-8879) where students can obtain information about courses and arrange for academic counselling regarding their programmes of study.

COURSES OPEN TO FIRST- AND HIGHER-YEAR STUDENTS

- BIO 110 **The Nature of Living Organisms**
(See BIO under "Biology")
- ZOO 200 **Selected Biological Aspects of Man** 2L, $\frac{1}{2}$ T:L1:MWF12, L2:MWF2
Man believes he "heads" a system of higher and lower organisms and is consequently largely independent of that system. In this course we question this belief by examining some attributes of man and his relation to the past, present and future biosphere through lectures and through essays and research projects by the students. Intended for non-biologists and biologists in any year. *F.M. Barrett, D.A. Chant, H.H. Harvey.*
- ZOO 201 **Selected Aspects of Animal Biology** 2L, 1T:Eve
Starting with some of the simplest forms of life, viruses and bacteria, and with especial reference to those that are intimately associated with man, the principles generally relevant to the success of all forms of life are examined. With this as a background the strategies for success of a number of acellular and multicellular organisms from a wide variety of habitats will be discussed, in order to show the effect that man has on them by his manipulation of the biosphere. Intended for non-biologists and biologists in any year. *D.F. Mettrick, J.D. Rising.*
Exclusion: ZOO 210 (1971-72)

COURSES OPEN TO SECOND- AND HIGHER-YEAR STUDENTS

- ZOO 211 **General and Human Genetics** 2L: $\frac{1}{2}$ T:MWF2, 1 $\frac{1}{2}$ P:W9-12
The subject matter includes basic principles, classical genetics, molecular genetics and mechanisms governing expression of genetically controlled characteristics. In addition, consideration is given to principles of population genetics and to the place of genetics in the framework of evolution. The genetics of Man is stressed throughout. Laboratories are given in alternate weeks. *M.E. Hatten.*
Exclusion: ANT 236, ZOO 226
- ZOO 212 **Physiology and Development** 2L, 3P L1:TR3, P1:T9-12, P2:T5.30-8.30 p.m.
This course considers the interactions between physiological functions and developmental processes. Topics include the fundamentals of animal physiology, development of respiration, physiology of reproduction and early development, growth and metabolism, nervous control of regeneration, and hormonal control of invertebrate metamorphosis and diapause. *F.M. Barrett, G. Holeton, R.A. Liversage, Y. Masui.*
Prerequisite: BIO 100/110/120

- ZOO 220 Animal Form and Function** 2L:MW4, 3P:T9-12
 This course deals with the structural diversity of animals, with emphasis on the functional rather than phylogenetic approach. Major topics include: levels of organization; cellular motility including prokaryotic, amoeboid, flagellar and ciliary movement; locomotion of Metazoa, feeding mechanisms and digestive structures; respiration stressing the ventilatory aspects. *J. Berger, W.G. Friend, J. Machin.*
Prerequisite: BIO 100/110/120
- ZOO 221 Cellular and Developmental Zoology** 2L:TR12, 3P:R9-12
 This course builds on the background in cellular biology obtained in the introductory course and integrates this with a study of developmental processes. Topics include ultrastructural diversity of cells, boundary functions, protein and nucleic acid synthesis, growth, the cell cycle, cytokinesis, senescence, cancer, descriptive and experimental embryology, theories of differentiation, and selected topics in development including its hormonal control, regeneration, and developmental genetics. *J. Berger, R. Elinson, S. Yuyama.*
Prerequisite: BIO 100/110/120
- ZOO 222 Animal Behaviour and Neurobiology** 2L, 3P L:TR4, P1:M9-12, P2:R9-12, P3:M2-5
 This course proceeds from a consideration of complex behaviour to treatment of simple behavioural acts, and finally to physiological factors underlying behaviour. Topics include sense organs, central nervous system, reflex arcs, effectors, behaviour patterns, social interaction, learning and memory. *D.W. Dunham, N. Mrosovsky, B.H. Pomeranz, J.J.B. Smith.*
Exclusion: PSY 250
Prerequisite: BIO 100/110/120
- ZOO 223 Animal Ecology** 2L, 3P L:TR12, P1:T9-12, P2:W9-12
 This course deals with relationships of organisms to their physical and biotic environment. Topics include: study of a particular ecosystem, physical environmental factors, biotic communities, trophic structure, energetics, and population processes. Ecological problems affecting man are briefly considered. Practical work includes field trips, experimental laboratories, and computer simulations. *J.B. Falls, R.C. Plowright, J.M. Speirs, H. Welch.*
Prerequisite: BIO 100/110/120; a statistics course is also recommended
- ZOO 224 Systematics and Phylogeny** 2L:MW1, 3P:M9-12
 This course emphasizes the principles of evolution and animal classification. Topics include: evolutionary theory, natural selection, population variation and polymorphism, elementary statistical analysis, species concepts, numerical taxonomy, cladistics, taxonomy, nomenclature, and current debates in systematics. *J. Rising.*
Prerequisite: BIO 100/110/120
- ZOO 225 Principles of Physiology** 2L, 3P L:TR1, P1:W9-12, P2:F9-12
 The course discusses the physical and chemical basis of biological processes at all levels of complexity: molecules, cells, organs, whole animals including humans and environment. Laboratory work emphasises the experimental basis of physiology. Topics include: respiration; circulation; membrane transport; osmoregulation and its hormonal control; comparative endocrinology; molecular basis and neural control of muscle contraction. *D.G. Butler, G. Holeton, J. Machin, B.H. Pomeranz.*
Prerequisites: BIO 100/110/120; CHM 240/241 is also recommended

- ZOO 226 Principles of Genetics** 2L:MW4, 3P:T9-12
 The description and treatment of the genetic methods used in studying a wide range of species are presented as examples of the application of the scientific method. The gene in both individuals and populations is discussed from an operational, mutational, cytological, and biochemical viewpoint. The application of genetic techniques to various biological disciplines is illustrated. *L. Butler, I. Tallan.*
Exclusion: ZOO 211, ANT 336
Prerequisite: BIO 100/110/120
- ZOO 250 Comparative Anatomy** 1L, 1T, 3P L1, T1:TR3, P1:W9-12, P2:R9-12, P3:F9-12
 The structural diversity and classification of vertebrates and the evolution of various organ systems are considered in lectures. The dogfish and cat are dissected in detail in the laboratory, and other forms are dealt with briefly, to illustrate the lecture material and present the student with a general picture of how a vertebrate is constructed. *T.S. Parsons.*
Prerequisite: BIO 100/110/120
- ZOO 251 Comparative Histology** 2L, 3P L:TR1, P1:M9-12, P2:F9-12
 This course emphasizes the concept that anatomy is physiology studied at a point in time. It includes an introduction to the principal techniques used in the study of cell structure and function, followed by a description of the primary tissues, then by consideration of their structural adaptations to special functions in various organs. *J. Lai-Fook.*
Prerequisite: BIO 100/110/120
- JPZ 252 Parasites and Parasitism**
 (See JPZ under "Joint Courses")
- ZOO 253 Invertebrate Zoology** 1L:W2, 3P:F9-12
 The classification of the invertebrate Phyla emphasizing the laboratory study of the diversity of each group together with the fundamental organization of a number of examples of the major Phyla. Collection and identification of specimens may also be included.
Prerequisite: BIO 100/110/120
- ZOO 254 History of Biological Science** 1L, 1T L:T4, T1:M1, T2:R4
 Some philosophies of Science are presented and their implications for biology discussed. Selected topics are used to illustrate the development of mechanistic and evolutionary theory. *F.H. Rigler.*
Prerequisite: BIO 100/110/120
- BIO 300F Terrestrial and Freshwater Biology**
 (See BIO under "Biology")
- BIO 301F Marine Biology**
 (See BIO under "Biology")

COURSES INTENDED PRIMARILY FOR FOURTH-YEAR STUDENTS

- ZOO 420 Molecular Genetics** 2L, 1T:MWF1
 A lecture course dealing with the concept of the gene, the manner in which it determines protein specificity and the genetic control of enzyme synthesis; and the mode of recombination in microorganisms leading to a discussion of the molecular basis of DNA replication, mutation and recombination. *I. Tallan.*
Prerequisite: ZOO 226
- JAZ 421F Human Genetics**
 (See JAZ under "Joint Courses")

- ZOO 422S **Population and Statistical Genetics of Man** (Not offered 1973-74) 1L, 3P
A course on the mathematical aspects of human genetics, including population genetics, quantitative genetics, and certain other specialized areas. *T.E. Reed.*
Prerequisite: JAZ 421F and a knowledge of elementary statistics and differential calculus
- ZOO 430 **Developmental Biology** 2L:TR11, 3P:M2-5
Invertebrate and vertebrate embryology and experimental morphology including topics on reproduction, cellular inheritance, gene expression and an analysis of the factors controlling regeneration and morphogenesis. *R.A. Liversage, Y. Masui.*
Prerequisite: BIO 100/110/120; ZOO 212/221 also recommended
- ZOO 432 **Cell Biology** 1L:T12, 3P:R2-5
Laboratory exercises supplemented by discussions on the energy relations of living cells, together with recent developments in the field. Enrolment limited. *A.M. Zimmerman.*
Prerequisite: BCH 320/321
- ZOO 433 **Radiation Biology** 1L:W2, 3P:W3-6
A course stressing the cellular effects of radiation. Enrolment limited. *G.M. Clark.*
Prerequisite: BIO 100/110/120; knowledge of mammalian physiology and basic physics
- ZOO 440 **Comparative Endocrinology** 1L:N, 3P:N
A course dealing primarily with the anatomy and physiology of endocrine glands in non-mammalian vertebrates. Endocrine control mechanisms for vertebrate homeostasis. *D.G. Butler.*
Prerequisite: BIO 100/110/120; some course in Physiology
- ZOO 441Y **Neurophysiology** 2L:TR10
A course providing an understanding of the physiology of nerves, muscles, sensory receptors, and nervous systems, and considering some recent research in this area. *H. Atwood, B.H. Pomeranz, J.J.B. Smith.*
Prerequisite: ZOO 222
- ZOO 442Y **Neurophysiological Experimentation** 4P:F1-5
A laboratory course providing training in methods used in neurophysiology. Individual research projects may be pursued. Limited enrolment. *H. Atwood, B.H. Pomeranz, J.J.B. Smith.*
Prerequisite: ZOO 222
Co-requisite: ZOO 441Y
- JPZ 443F **Physiology of Symbiotic and Parasitic Organisms**
(See JPZ under "Joint Courses")
- ZOO 450 **Animal Behaviour: Ethology** 1L:F11, 3P:W2-5
A course on the principles and methods of ethology, dealing with questions of the causation, function, survival value, and evolution of behaviour. *A.J. Hogan.*
Prerequisite: ZOO 222
- ZOO 460 **Protozoology** 2L:MW11, 3P:T2-5
The biology of the Protozoa. Lectures on ultrastructure, cytology, physiology, reproduction, genetics, evolution, and ecology of freeliving and parasitic Protozoa; laboratory will stress protozoan morphology, systematics, life-cycles, special techniques used to prepare Protozoa for microscopical examination, and host-examination. *J. Berger.*
Prerequisite: BIO 100/110/120
- ZOO 461 **Entomology** 1L:W9, 3P:W10-1
A course on the general features of insect life history, evolution, development; major types of insect food habits especially food finding, selection and utilization, insect habits and behaviour, especially social systems and their evolution. *G. Knerer.*
Prerequisite: BIO 100/110/120

- ZOO 462 **Advanced Invertebrate Zoology** (Not offered 1973-74) 1L, 3P
 A course on the phylogenetic theories that account for the various classifications of the invertebrates. Selected areas will be studied in depth. Laboratories will be set up as projects allowing students to produce new anatomical/morphogenetic evidence that tests phylogenetic predictions. Students will be instructed in the preparation and interpretation of serial sections.
Prerequisite: ZOO 253
- ZOO 463 **Advanced Vertebrate Zoology** 3P:F9-12, 1T:N
 A laboratory and seminar course in which students pursue individual projects on vertebrate morphology, using any available material of special interest to them. There will be a major essay and a seminar on part or all of their practical work, especially on its phylogenetic and evolutionary aspects. *T.S. Parsons.*
Prerequisite: ZOO 250
- ZOO 464 **Vertebrate Palaeontology** 3L:F2-5
 An illustrated lecture-laboratory-seminar course in the variety and evolution of extinct vertebrates, including consideration of the animals' modes of life and their environmental relationships in terms of modern evolutionary theory. There will be an essay on some research topic of particular interest to the student. *C.S. Churcher, C. McGowan, T.S. Parsons.*
Prerequisite: ZOO 250
- ZOO 465 **Ichthyology** 1L:3P:N
 A seminar and laboratory course emphasizing the systematics of Recent fishes, including some ecological, zoogeographical, and osteological aspects. Students do individual projects. *W.B. Scott, E.J. Grossman.*
Prerequisites: ZOO 250; ZOO 224 is also recommended
- ZOO 466 **Mammalogy** 1L:T1, 3P:T2-5
 The class Mammalia is reviewed using a systematic approach with consideration of general morphology, origin, evolution, adaptations, diversification, speciation, taxonomy and distribution. Lectures, seminars and laboratory periods are supplemented with individual projects, written reports and literature reviews. *R.L. Peterson.*
Prerequisite: ZOO 250; ZOO 224 is also recommended
- ZOO 467 **Ornithology** 2L:T1-3, 2P:T3-5
 A lecture, laboratory and seminar course on basic avian biology and on the systematics and distribution of birds of the world. Laboratory work includes extensive use of the world-wide collection of birds in the Royal Ontario Museum. *J.C. Barlow.*
Prerequisite: ZOO 250; ZOO 224 is also recommended
- ZOO 470Y **Limnology** 1L:1T:TR10
 This course deals only with lakes and combines a limited amount of traditional, descriptive limnology with an attempt to explore our present capacity to predict the effects of human activities on the properties of lakes. Since this approach has never formed the main stream of limnological activity, lectures are de-emphasized and the onus for the development of the course is carried partially by the students. *F.H. Rigler.*
Prerequisite: CHM 120 and ZOO 223
- ZOO 471Y **Limnology Practical** N
 Students work in pairs on one or more projects. The laboratory is open. *F.H. Rigler.*
Prerequisite: CHM 120 and ZOO 223
Co-requisite: ZOO 470Y

- ZOO 472S **Behavioural Ecology** 1L:F10, 3P:M2-5
 A lecture and seminar course treating behavioural aspects of basic problems in ecology. Selected topics such as territoriality, habitat selection, reproductive isolation and population regulation are discussed. *D.W. Dunham, J.B. Falls.*
Prerequisite: ZOO 222 & 223
- ZOO 473F **Animal Distribution** 1L:F10, 3P:M2-5
 Lectures, tutorials, readings and practical exercises designed to elucidate principles of zoogeography and aspects of ecology bearing on the distribution of animals. *R. Hansell.*
Prerequisite: BIO 100/110/120
- ZOO 474S **Ecological Energetics** 2L:TR9, 2P:F1-3
 A lecture, tutorial and practical course dealing with energy flow in ecological systems. Subjects covered will include parameters of animal bioenergetics such as growth and respiration, population, and patterns of whole ecosystem metabolism. *H. Welch.*
Prerequisite: ZOO 223
- ZOO 475F **Environmental Factors** 2L:TR9, 2P:F1-3
 A lecture, tutorial and practical course dealing with the effects of the physical environment on animals. *F.E.J. Fry.*
Prerequisite: ZOO 223
- ZOO 478F **Statistical Ecology** 2L:N, 2T:F1-3
 Basic principles and practice of sampling in ecology; estimation of population numbers, rates of mortality and recruitment; life tables; spatial distribution of species and measurement of species association; some theory of search, *J.E. Paloheimo.*
Prerequisite: STA 232/252 and ZOO 223/BOT 230/BOT 330
- ZOO 479S **Models in Ecology** 2L:N, 2T:F1-3
 Mathematical and computer models used in population and ecosystem dynamics and in their component processes. *J.E. Paloheimo.*
Prerequisite: STA 232/252 and ZOO 223/BOT 230/BOT 330
- ZOO 480S **Ecological Seminar** 4S:TR3-5,
 A seminar course on major theoretical and practical problems in aquatic ecology. Specific topics arranged between staff and students. *H.A. Regier.*
Prerequisite: ZOO 223.
- ZOO 481F **Population and Community Ecology** L:T3-5, P:R2-5
 Structural and dynamic aspects of ecological communities are discussed with particular reference to the stability and resilience of ecological systems undergoing stress. Current theoretical developments are evaluated in the light of data taken from the literature and the laboratory. *R.C. Plowright.*
Prerequisite: ZOO 223/BOT 330 (in 1972-73)
- ZOO 497Y **Project in Zoology** N
 A research project in some field of Zoology, requiring the prior consent of a member of the department to supervise the project. The topic is to be one mutually agreed on by the student and supervisor before enrolment in the course; they must also arrange the time, place and provision of any materials. This course will normally be open only to fourth year students with adequate background in Zoology.
Exclusion: ZOO 498
- ZOO 498 **Project in Zoology** N
 A research project in some field of Zoology, requiring the prior consent of a member of the department to supervise the project. The topic is to be one mutually agreed on by the student and supervisor before enrolment in the course; they must also arrange the time, place and provision of any materials. This course will normally be open only to fourth year students with adequate background in Zoology.
Exclusion: ZOO 497Y

OFFICERS OF THE UNIVERSITY

1972-1973

<i>Chancellor</i>	Pauline Mills McGibbon, S.M., B.A., LL.D.
<i>President</i>	J.R. Evans, M.D., D.Phil., F.R.C.P.(C.), LL.D.
<i>Assistant to the President</i>	N.S.C. Dickinson, C.D., B.A.
<i>Vice-President and Provost</i>	D.F. Forster, B.A., A.M.
<i>Vice-Provost, Research Administration</i>	Miss S. Dymond, B.A., Q.C.
<i>Vice-Provost</i>	J.D. Hamilton, M.D., F.R.C.P.(C.), D.Sc.
<i>Vice-Provost</i>	P.P.M. Meincke, B.Sc., M.A., Ph.D.
<i>Vice-Provost</i>	R. Ross, M.B.E., M.A.
<i>Vice-President, Institutional Relations and Planning</i>	J.H. Sword, M.A., LL.D.
<i>Vice-President, Business Affairs</i>	A.G. Rankin, B.Com., F.C.A.
<i>Assistant Vice-President</i>	F.R. Stone, B.Com., F.C.A.
<i>Vice-President, Internal Affairs</i>	Mrs. J.K. Conway, B.A., Ph.D.
<i>Secretary to the Governing Council</i>	D.S. Claringbold
<i>Chief Librarian</i>	R.H. Blackburn, M.A., B.L.S., M.S., LL.D.
<i>Acting Director of University Extension</i>	E.M. Gruetzner, B.A.
<i>Director of Admissions</i>	W. Kent, M.A.
<i>Director of Statistics and Records</i>	J.M. Tusiewicz, B.Sc.(Eng.), M.A.Sc., M.B.A.
<i>Director of Student Awards</i>	P.S. Phillips, B.A., C.A.
<i>Director of Finance</i>	M.E. Dedrick, M.Com.
<i>Director of Physical Plant</i>	J.T. Turner, B.Sc., P.Eng.
<i>Director, Special Projects</i>	G.P. Hiebert, B.Com., C.A.
<i>Director of Personnel</i>	R.F. Brown
<i>Director of Administrative Services</i>	M.A. Malcolm, B.A.
<i>Director of Information Systems Department</i>	V.H. Mikkelson
<i>Co-ordinator Campus Services</i>	Miss H.L. Reimer, B.A., B.Ped.
<i>Director of the Advisory Bureau</i>	D.J. McCulloch, B.A., M.D., D.Psych., F.R.C.P.(C.)
<i>Director of Athletics and Recreation (Men)</i>	A.D. White, B.A., M.Ed.
<i>Director of Athletics and Physical Education (Women)</i>	Miss A. Hewett, B.Ed., P.E.
<i>Director of Career Counselling and Placement Centre</i>	D. Currey, B.A.Sc.
<i>Director of University Health Service</i>	G.E. Wodehouse, M.C., M.D., F.R.C.P.(C.), M.R.C.P.
<i>Director of Housing Service</i>	Mrs. M.G. Jaffary, B.A.
<i>Director of the International Student Centre</i>	E.A. McKee, M.A.
<i>Warden of Hart House</i>	J.G. Longellé, M.A., Ph.D.
<i>Director of the University of Toronto Press</i>	M. Jeanneret, B.A., LL.D.
<i>Director of the University News Bureau</i>	K.S. Edey
<i>Director of Alumni Affairs</i>	J.W. Duncanson, B.A.
<i>Director of Development</i>	R.L. Jones

OFFICERS OF THE FACULTY OF ARTS AND SCIENCE

<i>Dean</i>	R.A. Greene, M.A., Ph.D.
<i>Associate Dean</i>	J.E. Cruise, B.A., M.S., Ph.D.
<i>Associate Dean</i>	J.E. Foley, B.A., Ph.D.
<i>Assistant Dean and Secretary</i>	W.D. Foulds, B.A.
<i>Associate Secretary</i>	R.B. Oglesby, C.D., M.A.
<i>Assistant Secretary</i>	C.R.C. Dobell, B.A.
<i>Assistant Secretary (Computer Systems)</i>	F. Ernst, B.A.Sc., M.B.A.

TEACHING STAFF

1972-73

ANTHROPOLOGY

Professor and Acting Chairman of the Department: T.F.S. McFeat, A.M., Ph.D.

Professors: W.P. Carstens, B.A., Ph.D.; R.W. Dunning, M.A., Ph.D.; J.N. Emerson, M.A., Ph.D.; D.R. Hughes, M.A., Ph.D.; W.N. Irving, B.A., Ph.D.; W.J. Samarin, B.A., Ph.D.

Professor (part-time): T.E. Reed, B.A., Ph.D.

Associate Professors: Miss F.D. Burton, M.A., Ph.D.; J.J. Chew, M.A., Ph.D.; R.B. Drewitt, M.A., Ph.D.; C.E. Hopen, M.A.; W.M. Hurley, M.A., Ph.D.; J.D. Kaye, M.A., Ph.D.; R. Knight, M.A., Ph.D.; R. Lee, M.A., Ph.D.; J. Mavalwala, M.Sc., Ph.D.; A. Mohr, A.B., Ph.D.; S. Nagata, M.A., Ph.D.; S.B. Philpott, M.A., Ph.D.; A.K. Ray, M.Sc., Ph.D.; H.E. Rogers, M.A., Ph.D.; H.B. Schroeder, M.A., Ph.D.; E.G. Schwimmer, M.A., Ph.D.; R.W. Shirley, M.A., Ph.D.; Miss B.A. Sigmon, B.A., M.Sc., Ph.D.; Miss S. Wallman, B.Sc., Ph.D.

Associate Professor (part-time): K.O. McCuaig, M.D.

Assistant Professors: M.D. Levin, M.A.; F.J. Melbye, M.A., Ph.D.; Miss L. Reinhardt, B.F.A., M.A., Ph.D.; S.A. Sper, M.A., Ph.D.; Mrs. R. L.M. Vanderburgh, M.A.; W. Weissleder, M.A., Ph.D.; R.A. Wright, B.A.

Visiting Professor: A.B. Chiarelli, Ph.D.

Special Lecturer: J.E. Anderson, M.D.

APPLIED SCIENCE AND ENGINEERING

MEMBERS OF THE FACULTY OF APPLIED SCIENCE AND ENGINEERING

CHEMICAL ENGINEERING

Professor: R.E. Jarvis, M.A., Ph.D., F.C.I.C., P.Eng., F.I.A.F.S.

Associate Professor: R.L. Hummel, B.S., Ph.D., P.Eng., F.C.I.C.

CIVIL ENGINEERING

Associate Professor: E.I. Robinsky, B.A., M.S., Ph.D.

ELECTRICAL ENGINEERING

Professors: E.E. Newhall, M.Sc., Ph.D.; J.G. Simmons, M.Sc., Ph.D., F.Inst.P.; K.C. Smith, M.A.Sc., Ph.D.

Associate Professors: V.C. Hamacher, M.Sc., Ph.D.; Z.G. Vranesic, M.A.Sc., Ph.D.

Assistant Professor: B. Rosario, B.Tech., M.S., Ph.D.

INDUSTRIAL ENGINEERING

Associate Professors: J. Abrham, M.A., Ph.D.; S.H. Cohn, M.A.; T.A. Lambe, M.Sc., Ph.D.; J.G.C. Templeton, A.M., Ph.D.

Assistant Professors: A.A. Cunningham, M.A., Ph.D.; M.J.M. Posner, B.A.Sc., Ph.D.; J.S. Rogers, B.Sc., M.S., Ph.D.; I.B. Turksen, M.S., Ph.D.

ASTRONOMY

Professor Emeritus and Director Emeritus of the David Dunlap Observatory: R.K. Young, B.A., Ph.D., F.R.S.C.

Professor and Chairman of the Department and Director of the David Dunlap Observatory: D.A. MacRae, A.M. Ph.D., F.R.A.S., F.R.S.C.

C.A. Chant Professor of Astronomy: J.F. Heard, M.A. Ph.D., LL.D., F.R.S.C.

Professors: J.D. Fernie, M.Sc., Ph.D.; Mrs. H.B.S. Hogg, A.M., Ph.D., D.Sc., F.R.S.C.; S. van den Bergh, M.Sc., Dr. rer nat, F.R.S.C., F.R.A.S.

Associate Professor: R.C. Roeder, M.Sc., Ph.D.; E.R. Seaquist, M.A., Ph.D.

Associate Professor (part-time): H.C. King, M.Sc., Ph.D., F.R.A.S.

Assistant Professors: S.P.S. Anand, M.A., Ph.D.; M.J. Clement, M.Sc., Ph.D.; R.F. Garrison, B.A., Ph.D.; P.P.Kronberg, M.Sc., Ph.D.; P.G. Martin, M.Sc., Ph.D.; J.R. Percy, M.A., Ph.D.; R. Racine, B.Sc., M.A., Ph.D.

Assistant Professors (part-time): C.T. Bolton, M.Sc., Ph.D.; W.H. Clarke, M.A., Ph.D.; P.C. Gregory, M.Sc., Ph.D.

BOTANY

Professors Emeriti: D.L. Bailey, B.A., M.S., Ph.D., F.R.S.C.; M.W. Bannan, B.A., Ph.D., F.R.S.C.; Miss D.F. Forward, M.A., Ph.D.; Mrs. M.L. Heimburger, M.Sc., Ph.D.; H.B. Sifton, M.A., Ph.D., F.R.S.C.

Professor and Chairman of the Department: J. Dainty, M.A., D.Sc.

Professor and Associate Chairman of the Department: R.F. Cain, M.A., Ph.D.

Professors: N.P. Badenhuizen, D.Sc.; J.E. Cruise, B.A., M.S., Ph.D.; P.F. Maycock, M.Sc., Ph.D.; G.B. Orlob, M.S., Ph.D.; Z.A. Patrick, B.Sc., Ph.D.; J.C. Ritchie, Ph.D., D.Sc.; K.H. Rothfels, B.A., Ph.D.

Associate Professors: P.W. Ball, B.Sc., Ph.D.; K.R. Chandorkar, M.Sc., Ph.D.; J.A. Hellebust, M.A., Ph.D.; T.C. Hutchinson, B.Sc., Ph.D.; G.F. Israelstam, B.Sc., Ph.D.; Mrs. E.R. Luck-Allen B.S., M.A., Ph.D.; J.H. McAndrews, M.S., Ph.D.; J.F. Morgan-Jones, M.Sc., Fil.Lic.; P. Sarkar, M.Sc., Ph.D.; Mrs. C. Sparling, B.Sc., Ph.D.; J.P. Williams, B.Sc., Ph.D.; G.A. Yarranton, B.Sc., Ph.D.

Assistant Professors: R.E. Dengler, B.S., Ph.D.; Mrs. N.G. Dengler, M.S., Ph.D.; W.G. Filion, M.Sc., Ph.D.; R.A. Frost, B.Sc., Ph.D.; J.W. Gear, Jr., M.S., Ph.D.; Miss V. Higgins, M.S., Ph.D.; P.A. Horgen, B.A., M.S., Ph.D.; P.V. Rangnekar, M.Sc., Ph.D.; T. Sawa, B.S., Ph.D.; Mrs. P. Stokes, B.Sc., Ph.D.; N.A. Straus, M.Sc., Ph.D.; G.R. Thaler, M.S., Ph.D.; M.T. Tyree, B.A., Ph.D.

Lecturers: Mrs. M. Heath, B.Sc., Ph.D.; T.M. Roberts, B.Sc., Ph.D.; Mrs. T. Slankis, B.Sc.

Instructor in Electron Microscopy: Y. Takahashi, B.S., D.Sc.

CHEMISTRY

Professors Emeriti: F.E. Beamish, M.A., D.Sc., F.R.S.C.; F.R. Lorrigan, B.E.M., M.A., Ph.D.; G.F. Wright, M.B.E., B.Sc., Ph.D., F.R.S.C.

Professor and Chairman of the Department: A.G. Brook, B.A., Ph.D.

Professor and Associate Chairman: A.G. Harrison, M.Sc., Ph.D.

Lecturer and Administrative Officer: K.B. Nielsen, M.A.

Professors: A.D. Allen, B.Sc., Ph.D.; G. Burns, B.S., A.M., Ph.D.; J.M. Deckers, L.Sc., Dr.Sc.; M.J. Dignam, B.A., Ph.D.; J.E. Guillet, B.A., Ph.D.; T. Hofmann, Dip.Chem., Dr.Sc.Tech.; D.J. Le Roy, M.A., Ph.D., F.R.S.C.; M.W. Lister, B.A., D.Phil.; S. McLean, B.Sc., Ph.D.; S.C. Nyburg, B.Sc., Ph.D.; A.J. Pož, B.Sc., M.A., Ph.D., D.Sc., D.I.C.; J.C. Polanyi, M.Sc., Ph.D., D.Sc., F.R.S., F.R.S.C.; K. Yates, M.Sc., Ph.D., D. Phil.; P. Yates, M.Sc., Ph.D., F.R.S.C.

Associate Professors: M. Bersohn, M.S., Ph.D.; B. Bosnich, B.Sc., Ph.D.; I.G. Csizmadia, Dip.Eng., M.Sc., Ph.D.; J.E. Dove, B.A., B.Sc., D. Phil.; R.O. Harris, B.Sc., M.A., Ph.D.; J.B. Jones, B.Sc., Ph.D., D. Phil.; G.A. Ozin, B.Sc., D. Phil.; J.J. Rae, M.A., Ph.D.; W.F. Reynolds, M.Sc., Ph.D.; E.A. Robinson, B.Sc., D.Sc., Ph.D.; G.H. Schmid, B.Sc., Ph.D.; I.W.J. Still, B.Sc., Ph.D.; J.C. Thompson, B.A., Ph.D., T.T. Tidwell, B.S., A.M., Ph.D.; J.P. Valteau, M.A., Ph.D.; J.C. Van Loon, B.Sc., Ph.D.; A. Walker, B.Sc., Ph.D.

Assistant Professors: J.W. Bunting, B.Sc., Ph.D.; R.B. Caton, B.A., Ph.D.; R.E. Kapral, B.Sc., Ph.D.; T.R. Lynch, B.Sc., M.A., Ph.D.; M. Menzinger, Dip.Eng., M.S., Ph.D.; O. Meresz, Dip.Org. Chem., Ph.D.; J. Powell, B.Sc., Ph.D.; S.G. Whittington, M.A.; M.A. Winnik, B.A., Ph.D.

Visiting Assistant Professors: M. Moskovits, B.Sc., Ph.D.; J.J. Sloan, B.Sc., Ph.D. (*part-time*)

Lecturer: Miss E. Leventhal, B.Sc., M.A.

Lecturers (part-time): A.R. Bassindale, M.Sc., D.Phil.; Mrs. M.E. Brereton, B.Sc., M.A.; H.W. Chang, M.S., Ph.D.; T.C. Clark, B.A., M.Sc., Ph.D.; J.A. Eenkhoorn, M.Sc., Ph.D.; B.I. Gold, B.A., Ph.D.; D.G. Gray, M.Sc., Ph.D.; R.P. Hughes, B.Sc., Ph.D.; W.G. Jackson, B.Sc., Ph.D.; R.A. McClelland, B.Sc., Ph.D., M.D.; M.D. Pattengill, B.S., Ph.D.; I.R. Peat, M.Sc., Ph.D.; Mrs. P. Plooard, M.Sc.; B. Rao, Ph.D.; H. Semerjian, M.Sc., Ph.D.; J.R. Stevens, M.Sc., Ph.D.; A. Ch. Vikis, B.Sc., Ph.D.; W.H. Wong, M.Sc., Ph.D.; R.M. Yealland, B.Sc., Ph.D.

CLASSICS

INTERCOLLEGIATE DEPARTMENT

Professor and Chairman of the Department: D.J. Conacher, M.A., Ph.D.

Assistant Professor and Undergraduate Secretary: K.R. Thompson, A.M.

UNIVERSITY COLLEGE

Professor Emeritus: G. Bagnani, D.Litt., F.R.S.C.

Professor and Chairman of the Department: G.V. Sumner, M.A.

Professors: N.E. Collinge, M.A., Ph.D.; M.J. O'Brien, M.A., Ph.D.; K.F. Quinn, M.A.; J.M. Rist, M.A.; A.E. Samuel, M.A., Ph.D.; R.M.H. Shepherd, M.A.; D.F.S. Thomson, M.A.; L.E. Woodbury, A.M., Ph.D.

Associate Professors: T.D. Barnes, M.A., D.Phil.; C.P. Jones, M.A., Ph.D.; H.J. Mason, A.M., Ph.D.

Assistant Professors: R.L. Beck, M.A., Ph.D.; P.S. Derow, B.A., Ph.D.; T.G. Elliott, B.A., Ph.D.; Miss C.I. Reid, B.A., Ph.D.; R.J. Tarrant, B.A., D.Phil.; M.B. Wallace, M.A., Ph.D.

Lecturer: G. Thaniel, M.A., Ph.D.

Special Lecturer: E.J. Weinrib, A.M., Ph.D.

Visiting Special Lecturer: E.I. Robbins, M.A., Ph.D.

VICTORIA COLLEGE

Professor Emeritus of Latin: H. Bennett, B.A., Ph.D., LL.D.

Professor Emeritus of Greek: H.G. Robertson, B.A., Ph.D.

Professor of Ancient History and Chairman of the Department: G.L. Keyes, M.A., Ph.D.

Professor of Latin: D.O. Robson, M.A., Ph.D.

Professor of Greek and Roman History: J.R. Grant, A.M., Ph.D.

Professor of Greek: D.P. de Montmollin, D. ès L.

Associate Professor: W.E. McLeod, A.M., Ph.D.

Assistant Professors: Miss J.M. Bigwood, M.A., Ph.D.; K.R. Thompson, A.M.; J.S. Traill, A.M., Ph.D.

Lecturer: J.W. Boake, M.A.

TRINITY COLLEGE

Professor Emeritus: G.M.A. Grube, M.A., F.R.S.C.

Associate Professor and Acting Head of the Department: J.W. Cole, M.A.

Professors: D.J. Conacher, M.A., Ph.D.; A. Dalzell, B.Litt., M.A.; Miss M.E. White, M.A., F.R.S.C., D.C.L.

Associate Professor (part-time): T.M. Robinson, B.A., B.Litt.

Assistant Professors: Mrs. R.E. Fantham, B.Litt., M.A., Ph.D.; C.J. McDonough, M.A., Ph.D.

ST. MICHAEL'S COLLEGE

Professor Emeritus: Sister M. St. John, M.A.

Professor and Head of the Department: Rev. J.J. Sheridan, M.A., Ph.D.

Professors: Sister M. Blandina, M.A.; Rev. J.R. O'Donnell, M.A., Ph.D., F.R.S.C.

Associate Professors: Sister E. Hanley, M.A., Ph.D.; Rev. D.J.J. McNeil, M.A.; A. Rakus, M.A., Ph.D.

Assistant Professors: Mrs. A.M. Dabrowski, M.A., Ph.D.; Sister M. O'Mara, M.A., Ph.D.; R.M. Toporoski, M.A., Ph.D.

Lecturer: Mrs. S. Morra, M.A.

COMPUTER SCIENCE

Professor and Chairman of the Department: T.E. Hull, M.A., Ph.D., F.R.S.C.

Associate Professor and Associate Chairman of the Department: Mrs. E.V. Swenson, M.A., Ph.D.

Professors: C.C. Gotlieb, M.A., Ph.D., F.R.S.C.; J.N.P. Hume, M.A., Ph.D.; A.B. Lehman, Ph.D.; K.C. Smith, M.A.Sc., Ph.D.

Visiting Professor: D.C. Handscomb, M.A., D.Phil.

Associate Professors: A. Borodin, M.Sc., Ph.D.; P.I.P. Boulton, M.A.Sc., Ph.D.; D.A. Clarke, M.A., Ph.D.; S.A. Cook, A.M., Ph.D.; V.C. Hamacher, M.Sc., Ph.D.; J.J. Horning, M.Sc., Ph.D.; R.L. Johnston, M.A., Ph.D.; P. Keast, Ph.D.; E.S. Lee, M.Eng., Ph.D.; L. Mezei, M.A.; D.F. Shanno, S.M., Ph.D.; D. Tsichritzis, M.A., Ph.D.; J.C. Wilson, M.Sc., Ph.D.; Z. Vranesic, M.A.Sc., Ph.D.

Visiting Associate Professor: G. Hall, M.Sc., Ph.D.

Assistant Professors: D.G. Corneil, M.A., Ph.D.; C.R. Crawford, M.A., Ph.D.; R.C. Holt, B.E.P., Ph.D.; J.D. Lipson, M.A.Sc., Ph.D.; J. Mylopoulos, M.Sc., Ph.D.; P.H. Roosen-Runge, M.A., Ph.D.; K.C. Sevick, S.M., Ph.D.; D.B. Wortman, M.Sc.

Visiting Assistant Professors: R.M. Baecker, M.Sc., Ph.D.; Miss S. Gerhart, M.Sc., Ph.D.

Lecturers: W.H. Enright, M.Sc., Ph.D.; R. Mathon, M.Sc., Ph.D.; J.K. Metzger, M.Sc.; A.E. Sedgwick, M.Sc.

EAST ASIAN STUDIES

Associate Professor and Acting Chairman of the Department: A.H.C. Ward, M.A.

Professors: W.A.C.H. Dobson, M.A., D.Litt., F.R.S.C.; C.C. Shih, M.A., B.D., Ph.D.; H.Y. Shih, M.A., Ph.D.

Associate Professors: J.S. Brownlee, M.A., M.Phil.; R. Chu, B.L.S., M.A.; M. Doleželová, M.A., Ph.D.; A.V. Liman, M.A.; I.J. McMullen, M.A., Ph.D.; C.D.C. Priestley, M.A., M.Phil., Ph.D.; W.G. Saywell, M.A., Ph.D.; B.A. Stephen, M.A.; K. Tsuruta, M.A., Ph.D.; D.B. Waterhouse, M.A., L.R.A.M.

Assistant Professors: D.J. Dohrenwend, A.M.; C. Stevens, M.A.

Lecturers: C.Y. Lee, B.A.; K. Nakajima, M.A.; R.K. Norris, B.A.; K.L. Richard, M.A.; L.T. Sigel, A.M.; R. Tyler, M.A.; S. Uyenaka, M.A.

ENGLISH

UNIVERSITY COLLEGE

Professors Emeriti: N.J. Endicott, B.A., B.Litt.; R.S. Knox, M.A.; J.R. MacGillivray, M.A., Ph.D., F.R.S.C.; F.E.L. Priestley, M.A., Ph.D., D.Litt., F.R.S.L., F.R.S.C.

Professor and Chairman of the Department: J.J. Carroll, M.A., Ph.D.

Professors: G.E. Bentley, Jr., B.A., B.Litt., D.Phil.; C.T. Bissell, C.C., M.A., Ph.D., D.Litt., LL.D., F.R.S.C.; C.R. Blake, M.A., Ph.D.; W.F. Blissett, M.A., Ph.D.; R. Davies, D.Litt., LL.D.; H.A. Gleason, Ph.D.; R.A. Greene, M.A., Ph.D.; P. Grosskurth, M.A., Ph.D.; W.H. Halewood, M.A., Ph.D.; P.L. Heyworth, M.A., B.Litt.; W.J. Keith, M.A., Ph.D.; C. Leech, M.A., Ph.D., D. ès L.; D.V. LePan, M.A., D.Litt., LL.D., F.R.S.C.; J.F. Leyerle, B.A., Ph.D.; D.G. Lochhead, M.A., B.L.S.; J. Lynen, M.A., Ph.D.; H.R. MacCallum, M.A., Ph.D.; J.M.R. Margeson, M.A., Ph.D.; M. Millgate, M.A., Ph.D.; A. Pritchard, B.A., Ph.D.; S.P. Rosenbaum, M.A., Ph.D.; D.I.B. Smith, M.A., D.Phil.; R.W. Van Fossen, A.M., Ph.D.; F.W. Watt, M.A., B.Litt., Ph.D.

Associate Professors: P.R. Allen, M.A., Ph.D.; H. Auster, M.A., Ph.D.; E.W. Domville, B.A., Ph.D.; R.I.C. Graziani, M.A., Ph.D.; B.S. Hayne, A.M., Ph.D.; W.J. Howard, M.A., Ph.D.; H. Kerpeck, M.A., Ph.D.; M.C. Kirkham, B.A., M.Phil.; A.C. Lancashire, M.A., Ph.D.; A.M. Leggatt, M.A., Ph.D.; P.V. Marinelli, M.A., Ph.D.; F.J. Marker, B.A., D.F.A.; P.F. Morgan, M.A., Ph.D.; M. Mueller, M.A., Ph.D.; O.H.T. Rudzik, M.A., Ph.D.; J. Skvorečky, Ph.D.

Assistant Professors: T.H. Adamowski, M.A., Ph.D.; F.J. Asals, Jr., M.A., Ph.D.; A.B. Cameron, M.A.; A.F. Cameron, M.A., B.Litt.; J.E. Chamberlin, M.A., Ph.D.; C.R. Chase, M.A., Ph.D.; W.L. Collins, M.A., Ph.D.; B. Corman, M.A., Ph.D.; H.B. de Groot, M.A., Ph.D.; V.A. De Luca, M.A., Ph.D.; A.H. de Quehen, B.A., Ph.D.; M.F.N. Dixon, M.A., Ph.D.; J.P. Dyson, M.A., Ph.D.; R. Frank, M.A., Ph.D.; G.A. Hamel, B.A., Ph.D.; D.B. Hill, Jr., M.A., Ph.D.; J. Kay, M.A., Ph.D.; W. Kime, M.A., Ph.D.; D.N. Klausner, B.A., Ph.D.; D.I. Lancashire, M.A., Ph.D.; W.M. Lebens, M.A., B.Litt.; B.S. Martineau, M.A., Ph.D.; S.F. Martineau, M.A., Ph.D.; S.F. Niermeier, M.A., Ph.D.; A. Patenall, M.A., Ph.D.; R. Rower, M.A., Ph.D.; P.H. Russell, M.A., Ph.D.; P.D. Seary, M.A., D.Phil.; M.S. Tait, M.A., Ph.D.; A.C. Thomas, M.A., Ph.D.; E.P. Vicari, M.A., Ph.D.; C. Visser, B.A., B.Litt., Ph.D.

Visiting Assistant Professor: G.D. Harley, M.A., Ph.D.

Lecturers: J.H. Astington, M.A.; A.J. Berger, M.A.; R.B. Bond, M.A.; E. Charney, M.A.; E.L. Costigan, B.A., B.Litt.; M.A. Creelman, M.A.; J. Jaunzems, M.A.; U. Kareda, M.A.; J.M. Kertzer, B.A., Ph.D.; M. Levene, M.A.; R.R. McLeod, M.A.; K. Theil, M.A.

Special Lecturer: R. Gill, M.A.

NEW COLLEGE (by cross-appointment)

Associate Professors: E.W. Domville, B.A., Ph.D.; B.S. Hayne, A.M., Ph.D.; M. Mueller, M.A., Ph.D.
Assistant Professors: F.J. Asals, Jr., M.A., Ph.D.; A.B. Cameron, M.A.; M.F.N. Dixon, M.A., Ph.D.;
 J.P. Dyson, M.A., Ph.D.; G.A. Hamel, B.A., Ph.D.; W.R. Kime, M.A., Ph.D.; Miss P.H. Russell,
 M.A., Ph.D.; C.W. Visser, B.A., B.Litt., Ph.D.

VICTORIA COLLEGE

Professor Emeritus: Miss K.H. Coburn, M.A., B.Litt., LL.D., F.R.S.L., F.R.S.C.

Professor and Chairman of the Department: D. Fox, M.A., Ph.D.

Professors: H.N. Frye, M.A., D.D., LL.D., D.Litt., L.H.D., F.R.S.C.; F.J.D. Hoeniger, M.A., Ph.D.;
 K.O. Kee, M.A., Ph.D.; D.J. Knight, M.A., Ph.D.; C.C. Love, M.A., Ph.D.; K. MacLean, B.A.,
 Ph.D.; M. MacLure, M.A., Ph.D.; J.M. Robson, M.A., Ph.D.; Miss A. Saddlemeyer, M.A., Ph.D.

Associate Professors: J.A. Carscallen, B.A., B.Litt., Ph.D.; C. Hamlin, B.A., Ph.D.; P.M. Hughes,
 M.A., Ph.D.; J.R. de J. Jackson, M.A., Ph.D.; Miss A.F. Johnston, M.A., Ph.D.; Miss J.J.
 Macpherson, M.A., B.L.S., Ph.D.; Mrs. J. Millgate, M.A., Ph.D.; Mrs. D.H. Parker, M.A.,
 Ph.D.; W.D. Shaw, A.M., Ph.D.

Assistant Professors: J.D. Baird, M.A., Ph.D.; D.A. Blostein, M.A., Ph.D.; Miss R. Harvey, M.Phil.,
 Ph.D.; J. Heath, M.A., Ph.D.; M. Laine, M.A., Ph.D.; J. Patrick, M.A.; L.W. Patterson, M.A.,
 Ph.D.; Miss M. Penman, M.A., Ph.D.; J.H. Reibetanz, M.A., Ph.D.; C.A. Silber, M.A., Ph.D.;
 Mrs. G.T. Warkentin, M.A., Ph.D.

Assistant Professor (part-time): Mrs. G.R. Cook, M.A., Ph.D.

Lecturer: Miss C. Hosek, A.M.

Lecturers (part-time): Mrs. H. Bannerji, M.A.; Mrs. R. Barker, Ph.D.; Mrs. J. Grant, M.A.; Mrs. M.
 Procter, M.A., M.Phil.

TRINITY COLLEGE

Professors Emeriti: P.A. Child, A.M., Ph.D.; Mrs. M.M. Kirkwood, M.A., Ph.D.

Professor and Head of the Department: M.T. Wilson, M.A., Ph.D.

Professors: G.G. Falle, M.A., Ph.D.; R.B. Parker, M.A., Ph.D., F.R.S.C.; S.P. Zitner, M.A., Ph.D.

Associate Professors: Mrs. P.L. Brückmann, M.A., Ph.D.; J.D. Duffy, M.A., Ph.D.; R.M.K. Schieder,
 M.A., Ph.D.; M.J. Sidnell M.A., Ph.D.

Associate Professor (part-time): A.G. Rigg, M.A., D.Phil.

Assistant Professors: D.D.C. Chambers, M.A., Ph.D.; Miss J.L. Levenson, M.A., Ph.D.; Mrs. N.R.
 Lindheim, M.A., Ph.D.; Miss M.H. Seaman, M.A.; R.L. Whitney, M.A., Ph.D.

Assistant Professor (part-time): W.D.H. Godfrey, M.A., M.F.A., Ph.D.

ST. MICHAEL'S COLLEGE

Professor and Chairman of the Department: D.J. Dooley, M.A., Ph.D.

Professors: J.M. Cameron, M.A.; F.T. Flahiff, M.A., Ph.D.; Sister M. Geraldine, M.A., Ph.D.;
 H.M. McLuhan, M.A., Ph.D., F.R.S.C.; Rev. H.V. Mallon, M.A.; J.C. Meagher, M.A., Ph.D.;
 Sister Frances Nims, M.A.; Rev. L.K. Shook, M.A., Ph.D.

Associate Professors: Rev. W.B. Hennessey, M.A.; Rev. C. Leland, M.A.; Rev. R.J. Madden, M.A.,
 Ph.D.; Sister Mary Madigan, M.A., Ph.D.; G.J. Matteo, M.A., Ph.D.; Sister Mary Arthur, M.A.,
 Ph.D.; Miss M.E. Moeslein, M.A., Ph.D.; R. O'Driscoll, M.A., Ph.D.

Assistant Professors: Rev. C. Arnold, M.A., Ph.D.; J. Kuhn, M.A.; W. O'Grady, M.A., Ph.D.; Mrs.
 J.M. Reibetanz, M.A., Ph.D.

Lecturer: M. Lynch, M.A.; S. Solecki, M.A.

Lecturers (part-time): Mrs. W.R. Orwen, M.A., Ph.D.; Mrs. R. Tully, M.A.

FINE ART

Professors Emeriti: P.H. Brieger, Ph.D., F.S.A., F.R.S.C.; J.W. Graham, M.A., Ph.D.

Professor and Chairman of the Department: F.E. Winter, Ph.D.

Associate Professor and Associate Chairman: R.P. Welsh, B.A., M.F.A., Ph.D.

Professors: H.B. Brooks, M.A., Ph.D.; L.F. Johnson, Ph.D.; G.S. Vickers, A.M.

Associate Professors: Mrs. E. Alföldi, Dr.Phil., Ph.D., F.S.A.; W. McAllister Johnson, B.A., M.F.A.,
 Ph.D.; H.-K. Lücke, Dr.Phil.

Associate Professors (part-time): Mrs. K.B. Brett; H.B. Burnham; H.A. Hickl-Szabo; Mrs. N. Leipen, M.A.; D.B. Webster, M.A.

Assistant Professors: R. Deshman, Ph.D.; H. Glass, B.A., M.F.A.; Miss M. van Rossen Hoogendyk, B.A., M.F.A.; D.S. Richardson, M.A., Ph.D.; D. Rifat, D.A.; J.W. Shaw, B.A., M.A.T., Ph.D.

Assistant Professor (part-time): Miss C.J. Holmes, B.A., B.L.S.

Lecturers: K. Andrews, M.F.A.; Mrs. J. Durham, M.A.; A. Paine, A.T.D., N.D.D., M.S.I.A.; Miss M. Walker, M.A.

Special Lecturer (part-time): Mrs. R.J. Bacso, B.A.

FRENCH

UNIVERSITY COLLEGE

Professors Emeriti: R.D.C. Finch, B.A., F.R.S.C.; C.D. Rouillard, A.M., Ph.D., Litt.D., F.R.S.C. Chevalier de la Légion d'Honneur, O.A.

Professor and Chairman of the Department: P.R. Robert, M.A., Ph.D.

Professor and Associate Chairman of the Department: J.A. Walker, M.A., Ph.D.

Professors: J.F. Flinn, M.A., D. de l'U.; V.E. Graham, M.A., Ph.D., D.Litt., F.R.S.C.; F.A. Hare, M.A.; D.M. Hayne, M.A., Ph.D., F.R.S.C.; E.A. Joliat, B.A., D. de l'U.; P.R.A. Leon, L. ès L., D. ès L.; C.R. Parsons, M.A., Ph.D.; R. Robidoux, L. ès L., D. de l'U.; M. Sanouillet, D. ès L., O.A.; H.G. Schogt, M.A., Ph.D.; G.F.R. Trembley, L. ès L., Ph.D.

Visiting Professors: H. Coulet, D. ès L.; L. Mailhot, D. de l'U.; H. Mitterand, D. ès L.

Associate Professors: A.C. Chesneau, L. ès L., D. ès L.; C. Cloutier-Wojciechowska, M.A., D. de l'U.; A.R. Curtis, M.A., D. de l'U.; J.A. Dainard, M.A., Ph.D.; L.E. Doucette, B.A., Ph.D.; P.R. Ducretet, M.A., D. de l'U.; A.G. Falconer, M.A., D. de l'U.; J.A. Fleming, M.A., Ph.D.; J.K. Gilbert, M.A., Ph.D.; D.F. Jourlait, L. ès L., D. de l'U.; E. Lehouck, Agr.E.S.S., D.Ph.L.; P.L. Mathews, A.M., Ph.D.; O.J. Miller, M.A., D. de l'U.; P.W. Nesselroth, M.A., Ph.D.; W.A. Oliver, M.A., D. de l'U.; H.H. Weinberg, M.A., Ph.D.

Assistant Professors: R. Baligand, M.A., Ph.D.; W.J. Bancroft, M.A., Ph.D.; P. Bouillaguet, L. ès L., D.E.S.; F.I. Case, M.A., D. de l'U.; J.A. Curtis, M.A., Phil.M.; P.R. Findlay, M.A., Ph.D.; F. Gerson, M.A., Ph.D.; E.A. Heinemann, M.A., Ph.D.; P.N. Joliat, M.A., D.P.F.E.; B.A. Kwant, M.A., Ph.D.; P. Martin, Ir.AIBr., D. de l'U.; L.B. Mignault, B.A., Ph.D.; C.L. Olsen, M.A., Ph.D.; C. Roberts, A.M., Ph.D.; B.-Z. Shek, M.A., Ph.D.; A.L. Stein, M.A., Ph.D.; D.A. Trott, M.A., Ph.D.; T.R. Wooldridge, B.A., D. de l'U.; J. Yashinsky, M.A., Ph.D.

Lecturers: N. Boursier, D.E.S., C.A.P.E.S.; G. Chesneau, D.E.S., C.A.P.E.S.; D. Clandfield, M.A.; M.-R. Cornu, M. ès L.; M.P. Ducretet, L. Philol. Rom., Agr.E.M.S.; R. Hrubí, D.P.F.E.; N. Maury, D. de l'U.; M.I. Raine, M.A.

Instructor: Mrs. M. Walker.

NEW COLLEGE (by cross-appointment)

Professor: F.A. Hare, M.A.

Associate Professors: J.K. Gilbert, M.A., Ph.D.; D.F. Jourlait, L. ès L., D.E.S., C.A.P.E.S., D. de l'U.; P.L. Mathews, A.M. Ph.D.; O.J. Miller, M.A., D. de l'U., W.A. Oliver, M.A., D. de l'U.

Assistant Professors: F.I. Case, M.A., D. de l'U.; F. Gerson, M.A., Ph.D.; E.A. Heinemann, M.A., Ph.D.; Mrs. B.A. Kwant, M.A., Ph.D.; Mrs. C. Roberts, A.M., Ph.D.

Lecturer: D. Clandfield, M.A.

Instructors (part-time): P.D. Krieger, M.A.; C.R. Thomson, M.A.

VICTORIA COLLEGE

Professor Emeritus: W.H. Trethewey, M.A., Ph.D., F.R.S.A., F.R.S.C.

Professor and Chairman of the Department: D.W. Smith, B.A., Ph.D.

Professors: D.E. Bouchard, A.M., Ph.D.; J.G. Chidaine, A.M., Ph.D.; A.R. Harden, A.M., Ph.D.; R.W. Jeanes, B.A., D. de l'U.; Miss L.E. Rièse, M.A., Ph.D., O.A., O.I.P., S.G.L.F.; A.C.M. Ross, M.A., Ph.D.; J.S. Wood, M.A., D. de l'U.

Associate Professors: P.A.R. Bouissac, L. ès L., D.E.S., D. en Phil.; E.N. Burstynsky, M.A., Ph.D.; Mrs. M.M. Léon, D. ès L., D.E.S., D. de l'U.; J.A. McClelland, M.A., Ph.D.; B.S. Merrilees, M.A., D. de l'U.; P.J.G.O. Perron, B.A., D. de l'U.; H.R. Secor, B.A., Ph.D.; R.A. Taylor, M.A., Ph.D.; C.D.E. Tolton, A.M., Ph.D.; E.A. Walker, M.A., Ph.D.

Assistant Professors: Mrs. J.L. Jeanes, L. ès L., L. en Dr.; R.J. Le Huenen, L. ès L., D.E.S., D. en Ph.; Mrs. A. Rathé, L. ès L., L. en Dr., Ph.D.; A. Rosenberg, M.A., Ph.D.; Mrs. N.J. Swallow, M.A., M.Phil.

Lecturers: H.S.F. Collins, M.A.; W.Z. Morawski, M.Phil.; Mrs. F.L. Robert, L. ès L.; J.D. Orsoni, M.A.; Mrs. C. Vercollier, D.E.S., C.A.P.E.S.

Instructors: Miss J. Friedfertig, Mrs. G. Nemeth, Lic. d'A., M.A.; Mrs. N. Trembley, L. en D., Miss D. Zana, Lic. d'A.

TRINITY COLLEGE

Professor and Head of the Department: B.T. Fitch, B.A., D. de l'U.

Professor: W.S. Rogers, M.A.

Associate Professors: W.T.E. Kennett, M.A., Ph.D.; W.J. Ruddock, M.A.

Assistant Professors: J.R. Brazeau, M.A.; L.C. Kerslake, M.A., Ph.D.; Mme. J. Savona, L. ès L., D.E.S., C.A.P.E.S., D. de l'U.

Assistant Professor and Director of Language Laboratory: A.M. Séguinot, C.A.P., C.E.L.G., M.A., D. de IIIème cycle.

Lecturer (part-time): J.-L. Bourget, L. ès L., Ancien élève E.N.S., Maître ès L., Agr. de l'U.

ST. MICHAEL'S COLLEGE

Professor Emeritus: Rev. L.J. Bondy, Chevalier de la Légion d'Honneur, M.A., Ph.D., D. ès L., LL.D.

Professor and Head of the Department: Rev. R.B. Donovan, M.A., Ph.D.

Professors: Mrs. P. Collet, A.M., Ph.D.; Rev. G.D. O'Gorman, M.A., Ph.D.

Associate Professors: F. Des Roches, Bpd., M.A., D.H.E.E., D. de IIIème cycle; Sister M. Eleanor, M.A., Ph.D.; C.M. Grisé, M.A., Ph.D.; Rev. J. Sablé, L.Th., D.E.S.

Assistant Professors: Rev. R.J. Fink, M.A., Ph.D.; P. Fitting, M.A., Ph.D.; P. Grillo, M.A., Ph.D.; P.G.P. Lafaury, L. ès L., D.E.S.; Mrs. M. O'Neill-Karch, M.A.; J.-C. Susini, L. ès L., D.E.S., C.A.P.E.S., Agr. de l'U.

Lecturers: D. De Kerckhove, M.A.; Mrs. F. Khettry, L. ès L., M.A.; Rev. C. Principe, L. ès L., M.A.; Mrs. J. Van Burek, M.A.

Instructor: Miss G. Laurens, B.A.

GEOGRAPHY

Professor Emeritus: D.F. Putnam, B.S.A., Ph.D.

Professor and Chairman of the Department: D. Kerr, M.A., Ph.D.

Professor and Associate Chairman: N.C. Field, M.A., Ph.D.

Professors: I. Burton, M.A., Ph.D.; L. Curry, M.A., Ph.D.; W.G. Dean, M.A., Ph.D.; G. Gracie, B.A.Sc., Ph.D.; F.K. Hare, D.Sc., Ph.D., LL.D., F.K.C., F.R.S.C.; P.W. Harrison, S.M., Ph.D.; A.V. Jopling, M.A., Ph.D.; J. Spelt, M.A., Ph.D.; J.J. van der Eyk, M.A., Ph.D.; J.T. Wilson, O.C., O.B.E., Ph.D., Sc.D., LL.D., P.R.S.C., F.R.S.

Associate Professors: A.M. Baker, M.A.; L.S. Bourne, M.A., Ph.D.; J.N.H. Britton, M.A., Ph.D.; P.W. Cave, M.A., D.Phil.; K.E. Francis, M.S., Ph.D.; J.H. Galloway, M.A., Ph.D.; B. Greenwood, B.Sc., Ph.D.; K. Hewitt, M.A., Ph.D.; J.T. Lemon, M.S., Ph.D.; R.D. MacKinnon, M.S., Ph.D.; J.A. May, M.A., Ph.D.; A.J. Scott, M.A., Ph.D.; J.W. Simmons, M.A., Ph.D.; C.J. Sparrow, B.Sc., Ph.D., A. Tayyeb, M.A.; J.B.R. Whitney, M.A., Ph.D.

Assistant Professors: H.F. Andrews, M.Sc., D.Phil.; M.F. Brunce, B.A., Ph.D.; G.J.D. Hewings, M.A., Ph.D.; J.C. Munday, Jr., A.B., Ph.D.

Lecturers: A.R. Byrne, M.A.; P. Duckworth, M.A.; G.H.K. Gad, D.Phil.; C.J. Houston, M.A.; T.F. McIlwraith, M.A.

GEOLOGY

Professor Emeritus of Paleontology: Miss M.A. Fritz, M.A., Ph.D., F.R.S.C.

Professor Emeritus of Mining Geology: G.B. Langford, B.A.Sc., Ph.D., F.R.S.C.

Professor and Chairman of the Department: D.W. Strangway, M.A., Ph.D.

Associate Professor and Acting Chairman: J.J. Fawcett, B.Sc., Ph.D.

Professors: G.M. Anderson, B.Eng., M.A.Sc., Ph.D.; F.W. Beales, M.A., Ph.D.; J.B. Currie, M.A., Ph.D.; A.M. Goodwin, M.Sc., Ph.D.; A.J. Naldrett, B.A., M.Sc., Ph.D.; E.W. Nuffield, B.A., Ph.D., F.R.S.C.; F.G. Smith, M.Sc., Ph.D.; J. T. Wilson, O.C., O.B.E., Ph.D., Sc.D., LL.D., P.R.S.C., F.R.S.

Visiting Professor: K. Rankama, Ph.D.

Associate Professors: A.G. Edmund, M.A., Ph.D.; J. Gittins, M.Sc., Ph.D.; D.H. Gorman, B.Sc., Ph.D.; S.E. Kesler, B.Sc., Ph.D.; G. Norris, M.A., Ph.D.; J.C. Rucklidge, B.A., Ph.D.; W.M. Schwerdtner, Dip. Geol., Dr.rer.nat.; S.D. Scott, M.Sc., Ph.D.; J.C. Van Loon, B.Sc., Ph.D.; J.B. Waterhouse, M.Sc., Ph.D.

GERMAN

UNIVERSITY COLLEGE

Professors Emeriti: H. Boeschstein, Ph.D., LL.D., F.R.S.C.; B. Fairley, M.A., Ph.D., Litt.D., LL.D., F.R.S.C., F.B.A.

Professor and Chairman of the Department: H.N. Milnes, M.A., Ph.D.

Professors: H. Eichner, B.A., Ph.D., F.R.S.C.; Miss M.J. Sinden, B.A., Ph.D.; H. Wetzel, Dr.Phil.

Associate Professors: W. Bauer, M.A.; R.W. Leckie, Jr., Ph.D.; W.A. Packer, M.A., Ph.D.; H. Roe, M.A., Ph.D.; H.G. Wiebe, M.A., Ph.D.

Assistant Professors: C. Butler, M.A., Ph.D.; W. Meyer-Erlach, M.A., Ph.D.; D. Myers, B.A., Ph.D.; J.P. Payne, M.A.

Special Lecturer: A. Krygsman, M.A.

VICTORIA COLLEGE:

Professors Emeriti: R.K. Arnold, Ph.D.; J.A. Surerus, B.A., D.Litt.

Professor and Chairman of the Department: G.W. Field, E.D., C.D., M.A., Ph.D.

Associate Professors: David Brett-Evans, M.A., Dr.Phil.; R.H. Farquharson, M.A., Ph.D.; C.N. Genno, M.A., Ph.D.

Assistant Professor: H.L. Mayer, Dr.Phil.; H.W. Seliger, M.A., Ph.D.

TRINITY COLLEGE:

Professor Emeritus: C. Lewis, M.A.

Professor and Head of the Department: D.A. Joyce, A.M., Ph.D.

Assistant Professor: A.D. Latta, M.A., Ph.D.

Lecturer: P.D. Harris, M.A.

Lecturer (part-time): J. Bielert, M.A.

ST. MICHAEL'S COLLEGE

Professor Emeritus: Mrs. V. Mueller-Carson, M.A., Ph.D.

Professor: E. Catholy, Dr.Phil.

Associate Professor and Acting Chairman: W. Hempel, Dr.Phil.

Assistant Professors: H. Froeschle, M.A., Ph.D.; G. Weissenborn, Ph.D.

Special Lecturer: H. Dierkes, M.A.

HISTORY

Professors Emeriti: D.J. McDougall, M.A., LL.D.; R.M. Saunders, M.A., Ph.D.; B. Wilkinson, M.A., Ph.D., LL.D., F.R.S.C.

Professor and Chairman of the Department: J.B. Conacher, M.A., Ph.D.

Associate Professor and Associate Chairman of the Department: M. Israel, M.A., Ph.D.

Professors: J.W. Abrams, A.B., Ph.D., F.R.A.S., F.A.A.S.; J.M. Beattie, M.A., Ph.D.; P. de B. Brock, M.A., Ph.D., D.Phil.; R.C. Brown, M.A., Ph.D.; J.C. Cairns, M.A., Ph.D.; J.M.S. Careless, A.M., Ph.D., F.R.S.C.; G.M. Craig, B.A., Ph.D.; J.L. Cranmer-Byng, M.C., M.A.; D.G. Creighton, C.C., M.A., LL.D., D.Litt., F.R.S.C.; B.S. Drake, B.A., LL.D.; W.J. Eccles, M.A., Ph.D.; A.C. Gluek, M.A., Ph.D.; W.A. Goffart, A.M., Ph.D.; J.L.H. Keep, B.A., Ph.D.; K.W. McNaught, M.A., Ph.D.; T.O. Lloyd, M.A., D.Phil.; J.S. Moir, M.A., Ph.D.; H.I. Nelson, M.A., Ph.D.; W.H. Nelson, M.A., Ph.D.; M.R. Powicke, M.A.; R.A. Spencer, M.A., D.Phil.; C.P. Stacey, O.B.E., C.D., A.M., Ph.D., LL.D., F.R.S.C.; A.P. Thornton, M.A., D.Phil., F.R.Hist.S.; J.-P. Wallot, M.A., Ph.D.; P.C.T. White, M.A., Ph.D.; N.P. Zacour, M.B.E., M.A., Ph.D.

Associate Professors: C.C. Berger, M.A., Ph.D.; W.C. Berman, M.A., Ph.D.; W.J. Callahan, M.A., Ph.D.; J.K. Conway, B.A., Ph.D.; M.S. Cross, M.A., Ph.D.; J. Dent, B.A., Ph.D.; H.L. Dyck, M.A., Ph.D.; J.M. Estes, M.A., Ph.D.; J.J. Gerson, M.I.A., Ph.D.; P.F. Grendler, M.A., Ph.D.; R.F. Harney, M.A., Ph.D.; R.J. Helmstadter, M.A., Ph.D.; D.C. Higgs, M.A., Ph.D.; M.A. Klein, M.A., Ph.D.; J. Kornberg, A.M., Ph.D.; D.P. Morton, M.A., Ph.D.; E.E. Rose, M.A.; T.A. Sandquist, M.A., Ph.D.; W.G.G. Saywell, M.A., Ph.D.; E.L. Shorter, M.A., Ph.D.; B. Sinclair, M.A., Ph.D.

Assistant Professors: R.D. Accinelli, M.A., Ph.D.; J.M. Bliss, M.A., Ph.D.; R. Bothwell, A.M., Ph.D.; R.V. Colman, M.A.; W.M. Dick, M.A., Ph.D.; M. Eksteins, B.A., D.Phil.; M.G. Finlayson, M.A., Ph.D.; J.P.B. Kenyon, M.A., Ph.D.; C. LaVigna, B.A., Ph.D.; T. Levere, M.A., D.Phil.; M.R. Marrus, M.A., Ph.D.; G. Patterson, M.A., Ph.D.; J.L. Pearl, M.A., Ph.D.; D.L. Raby, B.A., Ph.D.; A. Robson, M.A., Ph.D.; A. Rossos, M.A., Ph.D.; P.L. Thomsson, M.A.; W.B. White, A.B., M.S., Ph.D.

Lecturers: T.M. Brady, M.A.; M. Dafoe, M.A.; R.E. Johnson, B.A.; H. Marcus, M.A.; P. Rutherford, M.A.; A.N. Sheps, M.A.; M.P. Winsor, B.A., M.Phil.

Visiting Lecturers: A.L. Katchen, A.B.; S.J. Randall, M.A.; J. Shatzmiller, M.A., Ph.D.

HISTORY AND PHILOSOPHY OF SCIENCE AND TECHNOLOGY

MEMBERS OF THE INSTITUTE FOR THE HISTORY AND PHILOSOPHY OF SCIENCE AND TECHNOLOGY

Professor and Director of the Institute: J.W. Abrams, A.B., Ph.D.

Professor: S. Drake, A.B., LL.D.

Associate Professor: J.B. Sinclair, M.A., Ph.D.

Assistant Professors: T.H. Levere, B.A., D.Phil.; J. MacLachlan, B.A.Sc., Ed.M., Ph.D.; M.P. Winsor, M.Phil., Ph.D.

HYGIENE

MEMBERS OF THE SCHOOL OF HYGIENE

MICROBIOLOGY

Professor and Acting Chairman of the Department: R. Pakula, M.Sc., Ph.D.

Professor: L.W. Macpherson, Ph.D., M.R.C.V.S., D.V.S.M.

Associate Professors: J.B. Campbell, Ph.D.; Miss F.W. Doane, M.A.; M. Goldner, M.Sc., Ph.D.; A. Guha, M.Sc., Ph.D.; Mrs. J.F.M. Hoeniger, M.A., Ph.D.; Mrs. P.L. Seyfried, M.S.A.

Assistant Professors: A.G. Clark, Ph.D.; V.V. Kingsley, M.Sc., Ph.D.; Mrs. R. Sheinin, M.A., Ph.D.

PARASITOLOGY

Professor and Acting Chairman of the Department: R.S. Freeman, B.S., M.A., Ph.D.

Professors: A.M. Fallis, B.A., Ph.D., F.R.S.C.; D.F. Mettrick, B.Sc., Ph.D.

Associate Professors: S.S. Desser, M.Sc., Ph.D.; Miss S.B. McIver, B.A., M.S., Ph.D.; K.A. Wright, M.A., Ph.D.

ISLAMIC STUDIES

Professor and Chairman of the Department: R.M. Savory, M.A., Ph.D., F.R.S.C.

Associate Professor and Associate Chairman: L.M. Kenny, M.A.

Professors: Aziz Ahmad, B.A., D.Litt.; E. Birnbaum, B.A., Dipl. O.A.S.; M.E. Marmura, M.A., Ph.D.; G.M. Meredith-Owens, M.A.; G.M. Wickens, M.A., F.R.S.C.

Associate Professors: M.Q. Baig, M.A., Ph.D.; Mrs. A. Jwaideh Cox, M.A., B.Litt., D.Phil.; Mrs. L.V. Golombek, M.A., Ph.D.

Assistant Professors: J.R. Blackburn, M.A., Ph.D.; E.J. Keall, B.A., Ph.D.; Miss E. Marmura, M.A.; Miss R. Sandler, M.A., Ph.D.; Mrs. H.D. Shakeel, M.A., Ph.D.

ITALIAN AND HISPANIC STUDIES

Professors Emeriti: Miss O.D. Bickley, Dott. in Lett., M.A.; Miss B.M. Corrigan, M.A., Ph.D., D.Litt., F.R.S.C.; E. Goggio, M.A., Ph.D.

Professor and Chairman of the Department: G.L. Stagg, M.B.E., M.A., A.M.

Professor and Associate Chairman: S.B. Chandler, B.A., Ph.D.

Associate Professor and Associate Chairman: A.M. Gordon, A.M., Ph.D.

Professors: J. Gulsoy, M.A., Ph.D.; K.L. Levy, M.A., Ph.D., F.R.S.C.; D. Marin, M.A., Ph.D.; W.T. McCready, M.A., Ph.D.; J.A. Molinaro, M.A., Ph.D.; H.S. Noce, M.A., Ph.D.; J.H. Parker, M.A., Ph.D., F.R.S.C.; M.W. Ukas, M.A., Ph.D.; M.J. Valdés, M.A., Ph.D.; E. von Richthofen, Ph.D., Dr.Habil.

Associate Professors: T.B. Barclay, M.A., Ph.D.; R.J. Barta, M.A., Ph.D.; J.F. Burke, M.A., Ph.D.; G.P. Clivio, M.A., Ph.D.; K.A. A. Ellis, M.A., Ph.D.; A. Franceschetti, Dott. in Lett., Ph.D.; R.J. Glickman, A.M., Ph.D.; Mrs. M. Kuitunen, Dott. in Lett., M.A., Phil.M.; G. Mazzotta, M.A., Ph.D.; Miss M.E. Rugg, M.A., A.M.; A. Vicari, M.A., Phil.M.

Assistant Professors: Mrs. M. Corvetti, M.A., Phil.M.; O. Hegyi, M.A., Ph.D.; P. León, M.A., Ph.D.; Miss J.M. Maillard, M.A., Phil.M.; E.G. Neglia, M.A., Ph.D.; Mrs. O.L. Pugliese, M.A., Ph.D.; Mrs. W. Rolph, M.A., Phil.M.; Mrs. M. Scarth, M.A.; Miss B.E. Segall, M.A., Phil.M.; R. Skyrme, M.A., M.Litt., Ph.D.; Mrs. I. Versiani, M.A., Ph.D.; Miss J.R. Webster, M.A., Ph.D.

Lecturers: M. Acacia, M.A.; J. Ara, M.A.; R. Capozzi, M.A.; I. Chicoy-Dabán, M.A.; E. Costa, M.A.; J.B. Davies, A.M.; J.G. Hughes, M.A., Ph.D.; Mrs. P. Marchese, M.A., Phil.M.; L.T. McCormick, M.A.; G. Otálora, M.A.; F. Soppelsa, M.A.; A. Verna, M.A.

LINGUISTICS

Professor and Director: N.E. Collinge, M.A., Ph.D.

Professors: B. Brainerd, M.S., Ph.D.; H.A. Gleason, Jr., B.S., Ph.D.; P.H. Salus, B.Sc., A.M., Ph.D.; W.J. Samarin, M.A., Ph.D.

Associate Professors: R.I. Binnick, M.A., Ph.D.; E.N. Burstynsky, M.A., Ph.D.; J.J. Chew, M.A., Ph.D.; J.D. Kaye, M.A., Ph.D.; H.A. Roe, M.A., Ph.D.; H.E. Rogers, M.A., Ph.D.

Assistant Professors: J.K. Chambers, M.A., Ph.D.; P.A. Reich, M.S., Ph.D.; P.H. Roosen-Runge, A.M., Ph.D.; S.A. Sper, M.A., Ph.D.; J.D. Woods, M.A.; R.A. Wright, M.A.

MATHEMATICS

Professors Emeriti: I.R. Pounder, M.A., Ph.D.; N.E. Sheppard, M.A., F.I.A.; W.J. Webber, B.A., D.Sc.

Professor and Chairman of the Department: G.F.D. Duff, M.A., Ph.D., F.R.S.C.

Associate Professor and Associate Chairman of the Department: J.R. Vanstone, M.A., Ph.D.

Professors: F.V. Atkinson, M.A., D.Phil., F.R.S.C.; B. Brainerd, M.S., Ph.D.; J.H.H. Chalk, Ph.D., F.R.S.C.; H.S.M. Coxeter, B.A., Ph.D., D.Sc., LL.D., D.Math., F.R.S., F.R.S.C.; H.C. Davis, M.A., Ph.D.; D.B. DeLury, M.A., Ph.D., F.R.S.A.; D.A.S. Fraser, M.A., Ph.D., F.R.S.C.; W.H. Greub, M.A., Ph.D.; I. Guttman, M.A., Ph.D.; I. Halperin, M.A., Ph.D., F.R.S.C.; W. Haque, M.A., Ph.D.; H.A. Heilbronn, M.A., D.Phil., F.R.S., F.R.S.C.; T.E. Hull, M.A., Ph.D., F.R.S.C.; A.B. Lehman, B.S., Ph.D.; K.O. May, M.A., Ph.D.; K. Murasugi, M.A., D.Sc.; K.B. Ranger, B.Sc., Ph.D.; A. Rapoport, M.Sc., Ph.D.; G. de B. Robinson, M.B.E., B.A., Ph.D., F.R.S.C.; P.G. Rooney, B.Sc., Ph.D., F.R.S.C.; W.W. Sawyer, M.A.; P. Scherk, Ph.D., F.R.S.C.; M.S. Srivastava, M.Sc., Ph.D.; W.A.O'N. Waugh, M.A., D.Phil.

Associate Professors: M.A. Akcoglu, M.Sc., Ph.D.; D.V. Anderson, M.A., Ph.D.; D.C. Baillie, M.A.; E.J. Barbeau, M.A., Ph.D.; R. Beran, M.A., Ph.D.; T. Bloom, B.Sc., Ph.D.; E.P. Botta, M.A., Ph.D.; D.A. Clarke, M.A., Ph.D.; W.J.R. Crosby, M.A., Ph.D.; N.A. Derzko, B.Sc., Ph.D.; E.W. Eilers, Dr.rer.Nat.; P.H.H. Fantham, M.A., D.Phil.; L.T. Gardner, M.A., Ph.D.; P.C. Greiner, B.Sc., M.A., Ph.D.; M.P. Heble, M.Sc., Ph.D.; R.L. Johnston, M.A., Ph.D.; I. Kupka, Ph.D.; P.J. Leah, M.A., Ph.D., S.J.; J.E. LeBel, M.A., Ph.D.; E. Marchi, Lic.Math., Lic.Phys., D.Math.; D.R. Masson, M.Sc., Ph.D.; J. McCool, B.Sc., Ph.D.; E. Prugovecki, Dipl. Phys., Ph.D.; P. Rosenthal, M.A., Ph.D.; R.A. Ross, M.A., Ph.D.; P.L.J. Ryall, B.Sc., M.A., F.S.A., F.C.I.A., D.K. Sen, M.Sc., Dr.es Sc.; F.A. Sherk, B.A., M.Sc., Ph.D.; R.A. Smith, B.A., M.S., Ph.D.; S.H. Smith, B.Sc., Ph.D.; E. Stamm, Dipl.Maths., Dr.Sc.Math.; Mrs. E.V. Swenson, M.S., Ph.D.; S.M. Trott, B.Sc., M.A., Ph.D.; R. Wormleighton, M.A., Ph.D.

Visiting Associate Professors: E. Nordgren, Ph.D.; H. Radjavi, M.A., Ph.D.

Assistant Professors: D.F. Andrews, M.Sc., Ph.D.; R. Delver, Ph.D.; M.F. Gardner, M.S., Ph.D.; J.S. Halperin, M.Sc., Ph.D.; V. Jurdjevic, M.S., Ph.D.; P. Keast, B.Sc., Ph.D.; W.D. Lakin, M.S., Ph.D.; Y.S. Lee, M.Sc., Ph.D.; M. Mather, B.A., Ph.D.; E. Mendelsohn, M.Sc., Ph.D.; P.G. Norton, M.A., Ph.D.; S.J. Pierce, M.A., Ph.D.; J.P. Quinn, M.S., Ph.D.; F.D. Tall, A.B., Ph.D.; J.B. Wilker, M.A., Ph.D.

Visiting Assistant Professors: J.C. Fu, M.S., Ph.D.; S. Salaff, Ph.D.

Visiting Lecturers: J.C. Beukema, M.A.; P.H. Butler, Ph.D.; M.D. Craig, Ph.D.; A. Hopenwasser, Ph.D.; M. Iqbal, Ph.D.; P.A. Lawrence, Ph.D.; O.A. McBryan, Ph.D.; H. Mida, M.Sc., Ph.D.; S.I.B. Regoczai, M.Sc.; P.F. Renaud, Ph.D.; J.A. Rottenberg, M.A., Ph.D.; H. Seid, Ph.D.

MEDICINE

MEMBERS OF THE FACULTY OF MEDICINE

ANATOMY

Professor and Chairman of the Department: J.S. Thompson, M.A., M.D.

Professor: A.A. Axelrad, M.D., Ph.D.

Associate Professor: D.L. McLeod, M.D.

Assistant Professor: A.G. Erwin, M.D., M.Sc.

BIOCHEMISTRY

Professor and Chairman of the Department: G.R. Williams, Ph.D., D.Sc.

Professors: G.E. Connell, B.A., Ph.D.; J. Manery Fisher, M.A., Ph.D.; T. Hofmann, Dip.Chem., Dr.Sc.Tech.; B.G. Lane, B.A., Ph.D.

Associate Professors: R.A. Anwar, M.Sc., Ph.D.; K.J. Dorrington, B.Sc., Ph.D.; E.R.M. Kay, M.A., Ph.D.; R.K. Murray, M.B., Ch.B., M.S., Ph.D.; M.A. Packham, B.A., Ph.D.; R.H. Painter, B.Sc., Ph.D.; H. Schachter, B.A., M.D., Ph.D.; K.G. Scrimgeour, M.Sc., Ph.D.; W. Thompson, B.Sc., Ph.D.; D.O. Tinker, B.Sc., Ph.D.; J.T. Wong, B.A., Ph.D.

Assistant Professor: N. Camerman, B.Sc., Ph.D.

CLINICAL BIOCHEMISTRY

Professor and Chairman of the Department: A.G. Gornell, B.A., Ph.D., F.R.S.C.

Associate Professor: J.A. Kellen, M.D., C.Sc., F.R.C.P.(C.).

PHARMACOLOGY

Professor and Chairman of the Department: W. Kalow, M.D.

Professors: O. Hornykiewicz, M.D.; G.E. Johnson, Ph.D.; H. Kalant, M.D., Ph.D.; E. Llewellyn-Thomas, M.D., P.Eng.; A.B. Morrison, Ph.D.; W.H.E. Roschlau, M.D.; P. Seeman, M.D., Ph.D.; E.A. Sellers, M.D., Ph.D.; A.K. Sen, M.D., Ph.D.; F.A. Sunahara, Ph.D.; J. Talesnik, M.D.

Associate Professors: Y. Israel, Ph.D.; J.M. Khanna, Ph.D.; W.A. Mahon, M.D.

Assistant Professors: L. Endrenyi, Ph.D.; K.V. Flattery, M.D.; J.C. Hsia, Ph.D.; D. Kadar, Ph.D.; E.M. Sellers, M.D., Ph.D.; L. Spero, Ph.D.

Lecturers: R.G. Bell, M.D.; W. Forgiel, M.D.; Z. Harant, M.D.

PHYSIOLOGY

Professors Emeriti: C.H. Best, M.A., M.D., LL.D., F.R.S., F.R.S.C., F.R.C.P.; A.M. Rappaport, M.D., Ph.D.

Professor and Chairman of the Department: R.E. Haist, M.Sc., M.D., Ph.D., F.R.S.C.

Professors: J. Campbell, M.A., Ph.D.; D.W. Clarke, M.Sc., Ph.D.; I.B. Fritz, D.D.S., Ph.D.; J. Grayson, M.Sc., Ch.B., M.D., D.Sc.; J. Logothetopoulos, M.D., Ph.D.; F.C. Monkhouse, B.A., Ph.D.; J.W. Pearce, M.D., C.M., D.Phil.; J.W. Scott, M.A., M.D.; R.J. Shephard, B.Sc., M.B.B.S., M.D., Ph.D.; O.V. Sirek, M.D., M.A., Ph.D.; Mrs. A. Sirek, M.A., M.D., Ph.D.; G.A. Wrenshall, M.Sc., M.A., Ph.D.; M. Vranic, M.D., D.Sc.

Associate Professors: M.A. Ashworth, M.D., B.Sc.(Med.), Ph.D.; F. Coceani, M.D.; D.R. Crapper, M.D., F.R.C.P.(C.); D. Fraser, M.A., M.D., Ph.D.; P.E. Hallett, B.Sc., M.A., M.D.; A.A. Horner, B.A., Ph.D.; J. Hunter, M.A., Ph.D.; W.H. Johnson, B.Sc., Ph.D.; B.S.L. Kidd, M.B., B.Ch., B.A.O., M.D., M.R.C.P.(Edin.); J.M. Martin, B.Sc., M.D.; K.E. Money, M.A., Ph.D.; J.T. Murphy, A.B., M.D., Ph.D.; L.W. Organ, M.D., B.A.Sc.; R.M. Preshaw, M.B., Ch.B., F.R.C.S.Ed., M.D.; Mrs. M.J. Santalo, M.A., Ph.D.; H. Sonnenberg, M.Sc., Ph.D.; A.T. Storey, D.D.S., M.S., Ph.D.

Assistant Professors: G.M. Brown, B.A., M.D., D.Psych., Ph.D.; N.E. Diamant, M.D., F.R.C.P.(C.); G.G. Forstner, M.D., F.R.C.P.(C.); J.M. Fredrickson, B.A., M.D., F.R.C.S., F.A.C.S.; R.C. Goode, B.P.H.E., M.A., D.Phil.; Miss A.M. Hedlin, B.Sc.N., M.Sc., Ph.D.; J. Kryspin, M.D., Ph.D.; S.W. Kooh, M.D., Ph.D.; B.J. Lin, M.B.; K. Norwich, M.Sc., M.D., Ph.D.; D.H. Osmond, M.S.A., Ph.D.; J.A. Satterberg, B.Sc., M.A., Ph.D.; B.J. Sessle, M.Sc., M.D., Ph.D.; G. Steiner, B.A., M.D., M.R.C.P.(C.); G.R. Van Loon, B.Sc., M.D., Ph.D.

MUSIC

MEMBERS OF THE FACULTY OF MUSIC

Dean: J. Beckwith, Mus.M.

Professors: G. Ciamaga, M.F.A.; O. Morawetz, Mus.Doc.; H.J. Olnick, B.S., M.A.; G. Ridout, LL.D.

Associate Professors: A. Hughes, M.A., Ph.D.; T. Kenins, B.Litt; Miss M.R. Maniates, M.A., Ph.D.; C. Morey, M.M., Ph.D.

Assistant Professors: G.W. Drake, M.A., Ph.D.; R. Falck, B.Mus., M.F.A., Ph.D.; R. Hënninger, B.A., Mus.M.; D. Holman, Mus.Bac., D.Mus., F.R.C.O., F.R.S.C.M.

Lecturers: W.J. Buczynski; J. Hawkins, Mus.Bac., M.M.A.; Miss G. Jones, M.A., Ph.D.; G. Kushner.

Special Lecturers: M. Kolinski, M.D., Ph.D.; A.M. Walter, Jr.Utr., Mus.Doc.

Instructors: J. Kruspe, Mus.Bac., W. Wright, B.A., B.D., F.R.C.C.O.

NEAR EASTERN STUDIES

UNIVERSITY COLLEGE

Professors Emeriti: W.S. McCullough, M.A., B.D., Ph.D.; F.V. Winnett, M.A., Ph.D.; F.R.S.C.

Associate Professor and Chairman of the Department: R.F.G. Sweet, M.A., Ph.D.

Professors: A.K. Grayson, M.A., Ph.D.; D.B. Redford, M.A., Ph.D.; A.D. Tushingam, B.A., B.D., Ph.D.; J.W. Wevers, B.A., Th.B., Th.D.; R.J. Williams, M.A., B.D., Ph.D., F.R.S.C.

Visiting Professor: P.R. Ackroyd, M.A., Ph.D., D.D.

Associate Professors: J.S. Holladay, Jr., B.S., B.D., Th.D.; N.B. Millet, M.A., Ph.D.; F. Talmage, B.A., Ph.D.; J. Van Seters, M.A., B.D., Ph.D.; T.C. Young, Jr., B.A., Ph.D.

Assistant Professors: D.J. Lane, M.A.; L.D. Levine, B.A., Ph.D.; A.J. Mills, B.A.

Lecturers: T.V. Parfitt, M.A.; M. Wasserman, B.A.

VICTORIA COLLEGE

Professor and Chairman of the Department: E.G. Clarke, M.A., B.D., D.Litt.

Associate Professor: E.J. Revell, M.A., Ph.D.

Assistant Professor: A. Pietersma, M.A., B.D., Ph.D.

Lecturer: E.T. Lutz, M.A., B.D.

PHILOSOPHY

UNIVERSITY OF TORONTO

Associate Professor and Chairman of the Department: J.G. Slater, M.A., Ph.D.

Associate Professors and Associate Chairmen of the Department: L.W. Sumner, M.A., Ph.D.; F.F. Wilson, M.A., Ph.D.

Professors: R.E. Allen, M.A., Ph.D.; D.P. Dryer, A.M.; G. Edison, M.A., Ph.D.; D.D. Evans, B.A., B.D., D.Phil.; E.L. Fackenheim, M.A., Ph.D., D.D., LL.D., F.R.S.C.; D.P. Gauthier, A.M., D.Phil.; T.A. Goudge, M.A., Ph.D., F.R.S.C.; W.J. Huggett, M.A., Ph.D.; T.D. Langan, A.M., Ph.D.; R.F. McRae, M.A., Ph.D.; D. Savan, A.M.; K. Schmitz, M.A., M.S.L., Ph.D.; F.E. Sparshott, M.A.; B.C. van Fraassen, M.A., Ph.D.

Visiting Professor: P. Ricoeur, D. ès L.

Associate Professors: J.V. Canfield, A.M., Ph.D.; R.B. de Sousa, B.A., Ph.D.; L.W. Forgyson, M.A., Ph.D.; D. Goldstick, D.Phil.; J.A. Graff, A.M., Ph.D.; C.M.T. Hanly, M.A., Ph.D., Mrs. H. Hardy, M.A., Ph.D.; H.G. Herzberger, A.M., Ph.D.; J.F.M. Hunter, M.A., Ph.D.; R.A. Imlay, M.A., Ph.D.; J.C. Morrison, M.A., Ph.D.; G.B. Payzant, M.A., Ph.D.; H. Pietersma, M.A., Ph.D.; T.M. Robinson, M.A., B.Litt.; J.H. Sobel, M.A., Ph.D.; J.T. Stevenson, M.A.; C.W. Webb, M.A., Ph.D.; J.M.O. Wheatley, M.A., Ph.D.

Visiting Associate Professors: Y. Gauthier, M.A., D.Phil.; R. Meyer, M.A., Ph.D.

Assistant Professors: Miss C. Cassin, M.A., Ph.D.; C.H. Chastain, M.A.; L.M.G. Clark, B.Phil.; F.A. Cunningham, M.A., Ph.D.; W.R.C. Harvey, M.A., Ph.D.; P.H. Hess, M.A., Ph.D.; G.A. Nicholson, M.A., Ph.D.; A. Rosenthal, M.A., Ph.D.; M. Schiller, M.A., Ph.D.; M.T. Thornton, M.A., B.Phil., Ph.D.

Lecturers: L.R. Choptiany, B.Sc., M.A.; A.I.F. Urquhart, M.A.

UNIVERSITY COLLEGE

Associate Professor of Ethics and Chairman of the Department: J.G. Slater, M.A., Ph.D.

Professors: R.E. Allen, M.A., Ph.D.; D.P. Dryer, A.M.; D.D. Evans, B.A., B.D., D.Phil.; D.P. Gauthier, A.M., D.Phil.; T.A. Goudge, M.A., Ph.D., F.R.S.C.; R.F. McRae, M.A., Ph.D.; D. Savan, A.M.

Associate Professors: R.B. de Sousa, B.A., Ph.D.; L.W. Forgyson, M.A., Ph.D.; D. Goldstick, D.Phil.; C.M.T. Hanly, M.A., Ph.D.; J.F.M. Hunter, M.A., Ph.D.; R.A. Imlay, M.A., Ph.D.; J.C. Morrison, M.A., Ph.D.; L.W. Sumner, M.A., Ph.D.; F.F. Wilson, M.A., Ph.D.

Assistant Professors: F.A. Cunningham, M.A., Ph.D.; G.A. Nicholson, M.A., Ph.D.

VICTORIA COLLEGE

Associate Professor and Chairman of the Department: J.A. Graff, A.M., Ph.D.

Professor: F.E. Sparshott, M.A.

Associate Professor: H. Pietersma, M.A., Ph.D.

Assistant Professors: W.R.C. Harvey, A.M., Ph.D.; P. Hess, A.M., Ph.D.; M.T. Thornton, M.A., B.Phil., Ph.D.

Lecturer: L.R. Choptiany, B.Sc., M.A.

TRINITY COLLEGE

Professor and Head of the Department: G. Edison, M.A., Ph.D.

Professor: K.L. Schmitz, M.A., M.S.L., Ph.D.

Associate Professor: Mrs. H.L. Hardy, M.A., Ph.D.

ST. MICHAEL'S COLLEGE

Professor Emeritus: E. Gilson, Membre de l'Académie Française, D. ès L., Ph.D., D.Litt., LL.D.

Professor and Head of the Department: L.E.M. Lynch, M.A., M.S.L., Ph.D.

Professors: W.B. Dunphy, M.A., Ph.D.; Rev. J.M. Kelly, M.A., Ph.D.; T.J.F. Lang, M.A.; Rev. A.A. Maurer, M.A., Ph.D., F.R.S.C.; Rev. J. Owens, M.S.D., F.R.S.; A.C. Pegis, M.A., Ph.D., F.R.S.C.; Rev. E.A. Synan, S.T.L., M.A., M.S.L., Ph.D.

Associate Professors: B.F. Brown, M.A., Ph.D.; E.J. Kremer, A.B., Ph.D.; A.E. Wingell, M.A., M.S.L., Ph.D.

Assistant Professors: J. Hartley, M.A., Ph.D.; R.E. Tully, B.A., D.Phil.

Special Assistant Professor: Mrs. A. Lynch, M.A., M.S.L., Ph.D.

Lecturer: J.M. Vertin, B.A., S.T.B., S.T.L.

Lecturer (part-time): R.Z. Friedman, M.A.

PHYSICAL AND HEALTH EDUCATION

Members of the School of Physical and Health Education

Professor and Director: J.V. Daniel, B.P.H.E., B.A., M.S., Ph.D.

Assistant Professor: R.E. Stone, B.P.H.E., A.M., Ph.D.

PHYSICS

Professors Emeriti: Miss E.J. Allin, M.A., Ph.D.; J.M. Anderson, M.A., Ph.D.; C. Barnes, M.Sc., Ph.D.; H.J.C. Ireton, M.A., Ph.D.

Professor and Chairman of the Department: J.M. Daniels, M.A., D.Phil., F.R.S.C., F.Inst.P., F.R.S.A.

Professors and Associate Chairmen of the Department: R.L. Armstrong, M.A., Ph.D.; R. List, Dipl.phys.ETH, Dr.sc.Nat.

Professors: R.E. Azuma, M.A., Ph.D.; A.W. Brewer, M.Sc., Ph.D., A.Inst.P.; H.C. Corben, M.A., M.Sc., Ph.D.; R.M. Farquhar, M.A., Ph.D., F.R.S.C.; E. Fawcett, M.A., Ph.D.; G.D. Garland, M.A., Ph.D., F.R.S.C.; J. Goldemberg, B.S., Ph.D.; A.C.H. Hallett, B.A., Ph.D.; F.K. Hare, B.Sc., Ph.D., LL.D., D.Sc.; C.O. Hines, M.A., Ph.D.; J.V. Iribarne, Dr. in Chem.; D.G. Ivey, M.A., Ph.D.; A.E. Litherland, B.Sc., Ph.D., F.R.S.C.; A.D. May, M.A., Ph.D.; K.G. McNeill, M.A., D.Phil.; J.W. Moffat, Ph.D.; J.D. Prentice, M.Sc., Ph.D.; R.E. Pugh, M.A., Ph.D.; G.D. Scott, M.A., Ph.D.; B.P. Stoicheff, M.A., Ph.D., F.R.S.C.; D.W. Strangway, M.A., Ph.D.; J.C. Stryland, Ph.D.; H.W. Taylor, B.Sc., Ph.D.; L.E.H. Trainor, M.A., Ph.D.; J. Van Kranendonk, Ph.D., F.R.S.C.; S.H. Vosko, M.Sc., Ph.D.; H.L. Welsh, O.C., M.A., Ph.D., D.Sc., F.R.S.C., F.R.S.; G.F. West, M.A., Ph.D.; D. York, B.A., D.Phil.

Professor of Geophysics: J.T. Wilson, O.C., O.B.E., Ph.D., Sc.D., LL.D., P.R.S.C., F.R.S.

Associate Professors: R.C. Desai, B.Sc., Ph.D.; G.M. Graham, M.Sc., Ph.D.; P.A. Griffin, M.Sc., Ph.D.; J.D. King, B.A., Ph.D.; R.E. Kreps, B.Sc., Ph.D.; F.D. Manchester, M.Sc., Ph.D.; P.P.M. Meincke, B.Sc., M.A., Ph.D.; P.J. O'Donnell, B.Sc., Ph.D.; D.A.L. Paul, B.A., Ph.D.; D.J. Rowe, M.A., D.Phil.; M.B. Walker, B.Eng., D.Phil.; R.A. Wiggins, Ph.D.; S.S.M. Wong, M.S., Ph.D.; T.S. Yoon, M.Sc., Ph.D.

Assistant Professors: R.F. Code, A.M., Ph.D.; T.E. Drake, M.Sc., Ph.D.; D.J. Dunlop, M.A., Ph.D.; R.N. Edwards, B.Sc., Ph.D.; A.E. Jacobs, M.Sc., Ph.D.; A.W. Key, M.A., D.Phil.; P. Kirkby, M.Sc., Ph.D.; R.K. Logan, B.Sc., Ph.D.; G.J. Luste, B.A., Ph.D.; B.M. Moores, B.Sc., Ph.D.; J.M. Perz, M.A., Ph.D.; G.I.A. Stegeman, M.Sc., Ph.D.; M. Trefler, M.A., Ph.D.

Visiting Assistant Professor: H.C. Halls, M.Sc., Ph.D.

Assistant Professors (part-time): R.H. Graham, M.S., Ph.D.; K.P. Jackson, M.Sc., Ph.D.

Lecturers: A.M. Crocker, M.A.; P. Kantorek, Ph.D.; W.D. Lawrynuik, M.Sc., E.F. Mendis, B.A., Ph.D.; R.E. Munn, M.A., Ph.D.; J.M. Pitre, M.Sc., Ph.D.; T.L. Richards, M.A.; M.C. Robinson, M.Sc., Ph.D.; R.A. Strachan, M.A.; M.T. Yates, B.Sc., Ph.D.

POLITICAL ECONOMY

COMMERCE, ECONOMICS AND POLITICAL SCIENCE

Professors Emeriti: C.A. Ashley, B.Com., D.Litt., F.C.A.; V.W. Bladen, M.A., LL.D., D.Litt., F.R.S.C.; A. Brady, M.A., Ph.D., LL.D., D.Litt., F.R.S.C.; K.F. Helleiner, Ph.D., F.R.S.C.; H.A. Logan, A.B., Ph.D., F.R.S.C.; D.C. MacGregor, B.A., F.R.S.C.; A.F.W. Plumtre, C.B.E., M.A.

Professor and Chairman of the Department: J.S. Dupré, A.M., Ph.D.

Professor and Associate Chairman: A.M. Kruger, B.A., Ph.D.

COMMERCE

Professors: S.G. Hennessey, B.Com., F.C.A.; J.E. Smyth, M.Com., F.C.A.; M.S. Sommers, B.Com., D.B.A.

Associate Professors: B.J.B. Galvin, M.B.A., F.C.A., G.T. Gilbert, B.Com., C.A.; W.C. Hebdon, M.A., C.A.; J. Pollock, M. Litt., M.B.A., F.C.A.; J. Ronen, B.A., Ph.D.

Assistant Professors: M.J. Hare, B.Com.; F.G. Mathewson, B.Com., Ph.D.; H.E. McCandless, B.Com., M.B.A., C.A.

Visiting Professor: J.L. Livingstone, M.B.A., Ph.D.

Visiting Assistant Professor: M.M. Murenbeeld, M.Sc.

Lecturer: J.R. Walter, M.A., M.B.A.

Special Lecturers: A.D. Bishop, B.A., C.A.; L.J. Brooks, B.Com., M.B.A., C.A.; J.L. Callen, M.B.A.; P.T. Collican, B.A., C.A.; S.H. Cornforth, B.Com., C.A.; R.J. Dart, B. Com., C.A.; J.S. Darville, B.Com., M.B.A.; D. Doncaster, B.A., C.A.; H. Doran, B.Com. C.A.; E.A. DuVernet, B.A., Q.C.; H.F. Fiorillo, M.B.A.; R.C. Gibson, B.Com, C.A.; K.G.R. Gwynne-Timothy, B.A. B.S.(Law), LL.B., M.A., Q.C.; D. Herlick, M.B.A., C.A.; R.H. Kidd, B. Com., C.A.; P.H. Lyons, F.C.A.; P.E. McQuillan, B.Com., C.A.; T.C. O'Neill, B.Com., C.A.; P.I. Orenstein, B.Com., C.A., M.B.A.; W.J. Patterson, B.A.; R.P. Radchuck, B.Sc., B.Eng., C.A.; W.R. Rauenbusch, B.Com., LL.B., LL.M.; D.A. Scott, B.Com., C.A.; M. Shapiro, B.Com., C.A.; C.F. Steiss, B.A., C.A.; A.R. Thomas, B.Com., C.A.; R.C. Whitney, M.A.; R.I.R. Winter, B.Com., M.B.A., LL.B.; P. Yardley, B.A., F.C.A.

ECONOMICS

Professors: H. Atsumi, B.A., Ph.D.; R.M. Bird, M.A., Ph.D.; J.D. Bossons, A.M., Ph.D.; A.A. Breton, B.A., Ph.D.; D.R. Campbell, D.F.C., M.A.; J.H. Crispo, B.Com., Ph.D.; J.H. Dales, M.A., Ph.D., F.R.S.C.; A.R. Dobell, M.A., Ph.D.; I.M. Drummond, M.A., Ph.D.; W.T. Easterbrook, M.A.(Cantab.), Ph.D., LL.D., F.R.S.C.; H.C. Eastman, M.A., Ph.D.; J.E. Floyd, B.Com., M.A., Ph.D.; D.F. Forster, A.M.; M.J. Gordon, M.A., Ph.D.; H.A.J. Green, M.A., Ph.D.; W. Haque, M.A., M.S., Ph.D.; G.K. Helleiner, M.A., Ph.D.; S. Hollander, B.Sc.(Econ.), Ph.D.; R.W. Judy, M.A.; N.M. Meltz, B.Com., M.A., Ph.D.; E.P. Neufeld, B.A., Ph.D.; K.J. Rea, M.A., Ph.D.; A.E. Safarian, B.A., Ph.D.; J.A. Sawyer, B.Com., M.A., Ph.D.; L.B. Smith, B.Com., A.M., Ph.D.; S.G. Triantis, M.A., LL.B., Ph.D.; M.H. Watkins, B.Com.; A.M. Watson, B.Com., M.A.; T.A. Wilson, B.A., A.M., Ph.D.

Associate Professors: A. Abouchar, A.M., M.A., Ph.D.; N.K. Choudhry, B.A., M.S., Ph.D.; S.M. Eddie, B.S., Ph.D.; M.A. Fuss, B.Sc., M.A., Ph.D.; Y. Kotowitz, B.A., Ph.D.; G.F. McGuigan, M.A., Sc.Soc.D.; J.H.A. Munro, M.A., Ph.D.; D.M. Nowlan, B.Sc., M.A., Ph.D.; P. Pelikan, M.Sc., Ph.D.; D. Pokorny, Ph.D.; A. Rotstein, B.A., Ph.D.; G. Slasor, B.A.; D.A.A. Stager, M.A., Ph.D.; J.W.L. Winder, B.Com., M.A., Ph.D.

Assistant Professors: M.W. Bucovetsky, M.A., Ph.D.; D.E. Campbell, B.A., Ph.D.; J.L. Carr, B.Com., M.A., Ph.D.; F.R. Casas, B.A., M.S., Ph.D.; Miss G.C.A. Cook, M.A., Ph.D.; M.G.S. Denny, B.Sc., Ph.D.; D.E. Dewees, LL.B., Ph.D.; Mrs. S.B. Eastman, M.A., Ph.D.; D.K. Foot, B.Ec., Ph.D.; J.A.G. Grant, B.A., Ph.D.; G.V. Jump, B.A., Ph.D.; J.E. Pesando, M.A., Ph.D.; T.G. Rawski, A.B., M.A., Ph.D.; S.A. Rea, Jr., A.B., Ph.D.; J. Siegel, B.A., Ph.D.; L. Waverman, B.Com. M.A., Ph.D.

Visiting Professors: A. Dubuc, B.A., LL.L., L.Sc., D. ès Lett.; J. Harkness, M.A.; H. Mohring, A.B., Ph.D.

Visiting Associate Professor: J.A. Hynes, A.B.

Visiting Assistant Professor: A. Donner, M.A., Ph.D.

Lecturer: J.P. Warner, M.A.

Special Lecturer: C.B. Jutlah, M.A., Ph.D.

POLITICAL SCIENCE

Professors: J. Barros, A.B., M.I.A., Ph.D.; C. Bay, LL.B., Ph.D.; W.F. Berns, B.Sc., M.A., Ph.D.; A. Bloom, A.M., Ph.D.; M. Brownstone, B.Sc., M.S., Dr.P.A.; S.J. Colman, M.A.; J. Eayrs, A.M., Ph.D., F.R.S.C.; P.W. Fox, M.A., Ph.D.; W.E. Grasham, B.A.Sc., M.A.; J.E. Hodgetts, M.A., Ph.D., LL.D., F.R.S.C.; J.F. Hough, A.M., Ph.D.; D.M. Johnston, M.A., LL.M, M.C.L., J.S.D.; S.A. Lakoff, M.A., Ph.D.; J.T. McLeod, M.A., Ph.D.; C.B. Macpherson, B.A., D.Sc. (Econ.), D.Litt., LL.D., F.R.S.C.; J. Nun, LL.M., Ph.D.; R.C. Pratt, B.A., B.Phil., F.R.S.C.; P.H. Russell, B.A.; H.G. Skilling, M.A., Ph.D., F.R.S.C.; D.V. Smiley, M.Ed., M.A., Ph.D.; J.E. Smith, A.B., Ph.D.; Miss E.M. Wallace, B.A., Ph.D., F.R.S.C.

- Associate Professors:* W.K. Bryden, M.A.(Oxon.), Ph.D.; S.H.E. Clarkson, M.A., D. de R.; R.A. Fenn, B.A., M.Sc.(Econ.), Ph.D.; R. Gregor, M.A., Ph.D.; F.J.C. Griffiths, B.A., M.I.A., Ph.D.; Mrs. F.E. Hawkins, M.A., Ph.D.; C. Heiman, M.A., Ph.D.; G. Horowitz, M.A., Ph.D.; B. Kovrig, M.A., Ph.D.; R.A. Manzer, B.Ed., M.A.(Oxon.), Ph.D.; F.W. Peers, B.Ed., M.A., Ph.D.
- Assistant Professors:* E.G. Andrew, B.A., Ph.D.; J.S. Barker, M.A., Ph.D.; R.B. Day, M.A., Dipl.-R.E.E.S., Ph.D.; H.D. Forbes, M.A.; Miss C.J. Hughes, M.A.; A.A. Kontos, M.A., Barr. at Law, Ph.D.; R.O. Matthews, B.A., M.I.A., Ph.D.; K.R.J. Sandbrook, M.A., D.Phil.; D.V. Schwartz, M.A., Ph.D.; P. Silcox, M.A., Ph.D.; P.H. Solomon, M.A.; Mrs. S.G. Solomon, M.A.; R.E. Stren, M.A., Ph.D.
- Visiting Professors:* H. Guindon, M.A., Ph.D.; J.W. Holmes, M.A.
- Research Professor:* I. Schiffer, M.D.
- Lecturers:* R.S. Blair, M.A.; C.H. Fairbanks, M.A.; J.C. Terry, M.A.
- Special Lecturers:* A.C. Adamson, M.A.; Miss J.E. Esberey, B.Ed., B.Sc., M.A.; E.A. Goodman, B.A., Q.C.; T.A. Heinrichs, M.A.; Miss G.M. Patrick, M.A.; I. Scott, B.Sc., M.A.

PSYCHOLOGY

- Professors Emeriti:* E.A. Bott, O.B.E., B.A., D.Sc.; C.R. Myers, M.A., Ph.D.
- Professor and Chairman of the Department:* G.E. Macdonald, B.Ed., M.A., Ph.D.
- Professors:* D.E. Berlyne, M.A., Ph.D.; P.A. Kolers, M.A., Ph.D.; N.P. Moray, M.A., D.Phil.; B.B. Murdock, Jr., B.A., Ph.D.; J.C. Ogilvie, B.Sc., Ph.D.; A. Rapoport, S.M., Ph.D.; N. Slamecka, B.A., Ph.D.; E. Tulving, M.A., Ph.D.
- Associate Professors:* A.J. Arrowood, B.A., Ph.D.; G.B. Biederman, B.Sc., Ph.D.; H.E. Bishop, B.Sc., Ph.D.; F.I.M. Craik, B.Sc., Ph.D.; C.D. Creelman, M.A., Ph.D.; A.N. Doob, B.A., Ph.D.; J.E. Foley, B.A., Ph.D.; B. Forrin, M.A., Ph.D.; J.J. Furedy, M.A., Ph.D.; J.B. Gilmore, B.A., Ph.D.; J.E. Grusec, B.A., Ph.D.; J.A. Hogan, M.A., Ph.D.; R.O. Kroger, M.A., Ph.D.; M.W. Laurence, M.A., Ph.D.; R.S. Lockhart, M.A., Ph.D.; N. Mrosovsky, B.A., Ph.D.; B.B. Schiff, M.Sc., Ph.D.; M.C. Smith, B.A., Ph.D. (on leave); I.M. Spigel, M.A., Ph.D.; G.B. Thornton, M.A.Sc., Ph.D.; A.M. Wall, B.A., Ph.D.; G.C. Walters, B.A., Ph.D.
- Assistant Professors:* T.M. Alloway, M.S., M.A., Ph.D.; K.R. Blankstein, M.A., Ph.D.; B. Bragg, M.Sc., Ph.D.; C. Corter, B.A., Ph.D.; L. De Toledo, M.A., Ph.D.; K.K. Dion, B.A., Ph.D.; K.L. Dion, B.A., Ph.D.; M.G. Efran, B.A., Ph.D.; J.R. Graef, M.A., Ph.D.; T. Grusec, M.A., Ph.D.; L. Krames, M.A., Ph.D.; A. Kukla, M.A., C.Phil., Ph.D.; N.W. Milgram, M.A., Ph.D.; M. Moscovitch, B.Sc., M.A., Ph.D.; P.L. Pliner, B.S., Ph.D.; W.K. Potter, M.A., Ph.D.; P.A. Reich, M.A., Ph.D.; R.M. Rosenbaum, M.A.; J.A. Satterberg, M.A., Ph.D.; S.J. Shettleworth, M.A., Ph.D.
- Visiting Assistant Professor:* D. Reberg, M.A., Ph.D.
- Lecturers:* M. Drillings, M.A.; K.E. Patterson, M.A., Ph.D.
- Special Lecturers (part-time):* S.M. Abel, B.A., Ph.D.; R. Allon, M.A., Ph.D.; H. Brooker, M.A., Ph.D.; S.V. Levine, B.Sc., M.D., C.M.; D. Paitich, M.A., Ph.D.; S. Rochester, M.A., Ph.D.; C.D. Webster, M.A., Ph.D.

RELIGIOUS STUDIES

VICTORIA COLLEGE

- Professor and Chairman of the Department:* D.V. Wade, M.A., Ph.D.
- Professors:* E.E. Best, M.A., B.D., Ph.D.; K.J. Joblin, B.A., Th.M., D.D.
- Associate Professor (part-time):* R.H. Macdonald, A.M., Ph.D.
- Assistant Professor:* A.T. Davies, B.A., B.D., S.T.M., Th.D.
- Lecturer:* R.C. Hutchinson, B.Sc., B.D., M.A.
- Special Lecturers:* H.N. Frye, M.A., D.D., LL.D., D.Litt., L.H.D., F.R.S.C.; J.W. Grant, M.A., D.Phil., D.D.

TRINITY COLLEGE

- Professor and Chairman of the Department:* G.A.B. Watson, M.A., S.T.B.
- Professors:* Rev. D.R.G. Owen, M.A., Ph.D., D.D., D.C.L.; Rev. W.G. Oxtoby, M.A., Ph.D.

Assistant Professor: Rev. B.S. Alton, M.A., B.D., Ph.D.

Special Lecturers: Rev. E.R. Fairweather, M.A., B.D., Th.D.; Rev. J.C. Hurd, B.S., B.D., M.A., Ph.D.

ST. MICHAEL'S COLLEGE

Professor and Chairman of the Department: Rev. A.G. Gibson, Ph.L., S.T.D.

Professors: Rev. G.G. Baum, M.A., D.Th.; Rev. J.E. Bruns, S.T.D., S.S.L.; L.S. Dewart, M.A., Ph.D.

Associate Professors: Rev. D.E. Belyea, M.A., S.T.D.; P.B. Bilianuk, D.Th., D.Phil.; H.J. McSorley, B.S., M.A., D.Th.; H.W. Richardson, S.T.B., M.A., Ph.D.; Rev. R.J. Schiefen, M.Ed., S.T.B., M.A., Ph.D.; E. Skublics, S.T.B., D.Th.

Assistant Professors: Mrs. J. Dewart, M.A., Ph.D.; J.T. O'Connell, A.B., Ph.D.; Rev. D. Donovan, B.A., S.S.L., S.T.O.

Special Lecturers: J.C. Meagher, M.A., Ph.D.; J.M. Vertin, S.T.L., M.A.

SANSKRIT AND INDIAN STUDIES

Professor and Chairman of the Department: A.K. Warder, B.A., Ph.D. (on leave until 1 July 1973).

Professor and Acting Chairman of the Department: R.M. Smith, M.A.

Professors: B.K. Matilal, A.M., Ph.D.; T. Venkatacharya, M.A.

Associate Professors: G.T. Artola, M.A., Ph.D.; J.D. Dhirasekera, B.A., Ph.D.; J.L. Masson, B.A., Ph.D.; C.D.C. Priestley, M.A., Phil.M., Ph.D.; N.K. Wagle, M.A., Ph.D.

Assistant Professor: N. Kobayashi, M.A.

Lecturer: S. Katsura, M.A.

SLAVIC LANGUAGES AND LITERATURES

Associate Professor and Chairman of the Department: C.H. Bedford, M.A., Ph.D.

Associate Professor and Associate Chairman: G. Žekulin, Ing.Com.Sc., M.A.

Professors: H.E. Bowman, M.A., Ph.D.; L. Doležel, Ph.Dr.; Mrs. K.B. Feuer, M.A., Ph.D.; G. Luckyj, M.A., Ph.D.

Associate Professors: B. Budurowycz, M.A., B.L.S., Ph.D.; D.G. Huntley, B.Sc.(Econ.), M.A., Ph.D.; M. Surducki, M.A., Ph.D.; R.D.B. Thomson, D.Phil.

Assistant Professors: Mrs. D. Bienkowska, M.A., Ph.D.; Mrs. H. Floruk, M.A. Miss G. Kruberg, M.A.; R. Lindheim, M.A.; R.H. Marshall, M.A., Ph.D.; N. Shneidman, M.A., Ph.D.; D.S. Struk, M.A., Ph.D.

Lecturers: Mrs. M. Kirkoff, M.A.; K.M. Lantz, M.A.

SOCIOLOGY

Professor and Chairman of the Department: I.M. Zeitlin, M.A., Ph.D.

Professors: R.F. Badgley, M.A., Ph.D.; N.W. Bell, M.A., Ph.D.; R. Breton, M.A., Ph.D.; S.D. Clark, M.A., Ph.D., F.R.S.C.; L.S. Feuer, A.M., Ph.D.; P.J. Giffen, M.A.; O. Hall, M.A., Ph.D.; R.L. James, M.A., Ph.D.; W.E. Kalbach, M.A., Ph.D.; R.A. Lucas, M.A., Ph.D.; W.M. Michelson, A.M., Ph.D.; P.K. New, M.A., Ph.D.; H.K. Nishio, B.A., Ph.D.; L. Zakuta, M.A., Ph.D.

Associate Professors: H. Cooperstock, M.A.; W.M. Gerson, M.A., Ph.D.; E.B. Harvey, M.A., Ph.D.; W.W. Isajiw, M.A., Ph.D.; R.W. Osborn, Ph.D.; K.N. Walker, M.A., Ph.D.; B. Wellman, M.A., Ph.D.; J.L. Wilkins, M.A., Ph.D.

Assistant Professors: B. Baldus, M.A., Dr.Sc.pol.; R.C. Beals, M.A., Ph.D.; A.M. Bennett, M.A.; H.J. Breslauer, M.A., M.Phil.; I.D. Currie, M.A.; L.F. Felt, B.A., Ph.D.; L. Howard, M.A.; M. Kelner, M.A., Ph.D.; J.B. Kervin, B.A., Ph.D.; J.A. Lee, M.A., Ph.D.; J.L. Lennards, M.A.; P. Lorion, M.A., Ph.D.; D.W. Magill, M.A.; H.M. Makler, M.A., Ph.D.; W. Phillips, M.A.; J.G. Reitz, B.S., Ph.D.; J. Salaff, M.A., Ph.D.; J.H. Simpson, B.D., Th.M., Ph.D.; A.H. Smith, M.A.; P.H. Solomon, M.A.; M.W. Spencer, M.A., Ph.D.; L. Tepperman, A.M., Ph.D.; J.L. Turk, M.A., Ph.D.; J. Wayne, M.A., Ph.D.

Visiting Assistant Professors: L. Johnson, Ph.D.; L. Marsden, Ph.D.

Lecturers: R.W. Burnside, M.A.; S. Cook, M.A., Phil.M.; N. Hartmann, M.A.; J. Joyner, M.A.; R. O'Toole, M.A.; A.T.R. Powell, M.A.

Lecturers (part-time): L. Bell, M.A.; R. Gerrish, M.A.; R. Rosen, M.A.

ZOOLOGY

Professors Emeriti: C.E. Atwood, M.S.A., Ph.D.; A.F. Coventry, B.A.; E.H. Craigie, B.A., Ph.D., F.R.S.C.; Miss V.E. Englebert, M.S.A., Ph.D.; A.G. Huntsman, B.A., M.D.; F.P. Ide, M.A., Ph.D.

Professor and Chairman of the Department: D.A. Chant, M.A., Ph.D.

Professor and Associate Chairman: R.R. Langford, B.Sc., Ph.D.

Professors: H.L. Atwood, M.Sc., Ph.D.; L. Butler, M.S.A., Ph.D.; C.S. Churcher, M.Sc., Ph.D.; G.M. Clark, M.Sc., Ph.D.; A.M. Fallis, B.A., Ph.D.; J.B. Falls, B.A., Ph.D.; R.S. Freeman, M.A., Ph.D.; W.G. Friend, Ph.D.; F.E.J. Fry, M.B.E., M.A., Ph.D., F.R.S.C.; H.H. Harvey, M.Sc., Ph.D.; R.A. Liversage, M.A., Ph.D.; D.F. Mettrick, B.Sc., Ph.D.; T.S. Parsons, M.A., Ph.D.; R.L. Peterson, M.A., Ph.D.; D.H. Pimlott, M.Sc., Ph.D.; T.E. Reed, B.A., Ph.D.; F.H. Rigler, M.A., Ph.D.; B.I. Roots, B.Sc., Ph.D.; W.B. Scott, M.A., Ph.D.; F.A. Urquhart, M.A., Ph.D.; G.B. Wiggins, M.A., Ph.D.; A.M. Zimmerman, B.A., M.S., Ph.D.

Associate Professors: J.V. Barlow, M.A., Ph.D.; J. Berger, M.Sc., Ph.D.; D.G. Butler, M.Sc., Ph.D.; I.M. Campbell, B.Sc., M.A., Ph.D.; D.H. Collins, B.Sc., Ph.D.; E.J. Crossman, M.A., Ph.D.; S.S. Desser, M.Sc., Ph.D.; M.F. Filosa, M.S., Ph.D.; J. Machin, B.Sc., Ph.D.; Y. Masui, M.Sc., Ph.D.; N. Mrosovsky, B.A., Ph.D.; J. Paloheimo, M.A., Ph.D.; P.J. Pointing, B.Sc.F., Ph.D.; H.A. Regier, M.A., Ph.D.; J.J.B. Smith, B.Sc., Ph.D.; Miss C.M. Sullivan, M.Sc., Ph.D.; I. Tallan, B.S., Ph.D.; J.R. Tamsitt, M.A., Ph.D.; G.M. Telford, B.Sc., Ph.D.

Assistant Professors: F.M. Barrett, M.Sc., Ph.D.; A.G. Bell, M.A.; I.R. Brown, B.Sc., Ph.D.; D.W. Dunham, B.S., Ph.D.; R.P. Elinson, B.Sc., Ph.D.; D. Gibo, B.A., Ph.D.; C.K. Govind, M.Sc., Ph.D.; Mrs. M.E. Hatton, B.A., Ph.D.; G.F. Holeton, M.Sc., Ph.D.; G.A. Knerer, M.A., Ph.D.; Miss J.E. Lai-Fook, B.Sc., Ph.D.; M.A. Mantuani, B.Sc., Ph.D.; G.K. Morris, B.S.A., M.S., Ph.D.; D.H. O'Day, M.Sc., Ph.D.; R.C. Plowright, M.A., Ph.D.; B. Pomeranz, M.D., Ph.D.; J. Rising, B.A., Ph.D.; W.G. Sprules, B.Sc., M.A., Ph.D.; H. Welch, B.A., Ph.D.; K.A. Wright, M.A., Ph.D.; J.H. Youson, B.A., M.Sc., Ph.D.; S. Yuyama, B.A., Ph.D.

Assistant Professor (part-time): Mrs. A.J. Hogan, Ph.D.

Lecturers: R.I.C. Hansell, B.Sc., Ph.D.; Mrs. B.M. Solandt, M.A.; J.M. Speirs, Ph.D.

Special Lecturers: Miss A.M. McGregor; Mrs. M. Parsons, M.A., Ph.D.

Instructors: D.R.S. Lean, B.Sc.; Mrs. M.E. MacCallum, M.Sc., Miss W.P. Sweaney, M.Sc.

ERINDALE COLLEGE

(All members of the Erindale College teaching staff hold appointments in University or University College departments.)

Professors: J. Barros, A.B., M.I.A., Ph.D., (Political Science); J.M. Deckers, L.Sc., D.Sc. (Chemistry); J.S. Dupré, A.M., Ph.D. (Political Science); W.T. Easterbrook, M.A., Ph.D., LL.D., F.R.S.C. (Economics); J.E. Floyd, B.Com., M.A., Ph.D., (Economics); A.C. Gluek, M.A., Ph.D., (History); G. Gracie, B.A.Sc., Ph.D., (Geography); W.E. Grasham, B.A.Sc., M.A., (Commerce); H.A.J. Green, M.A., Ph.D., (Economics); P.W. Harrison, S.M., Ph.D., (Geography); W.J. Huggett, M.A., Ph.D., (Philosophy); W.E. Kalbach, M.A., Ph.D., (Sociology); A.M. Kruger, B.A., Ph.D., (Economics); S.A. Lakoff, M.A., Ph.D., (Political Science), P.F. Maycock, M.Sc., Ph.D., (Botany); A.J. Poč, B.Sc., M.A., Ph.D., D.Sc., (Chemistry); B.I. Roots, B.Sc., Ph.D., (Zoology); D.V. Smiley, M.Ed., M.A., Ph.D., (Political Science); J.E. Smith, A.B., Ph.D., (Political Science); M.S. Sommers, B.Com., M.B.A., D.B.A., (Commerce); H.W. Taylor, B.Sc., Ph.D., (Physics); R.W. Van Fossen, A.M., Ph.D., (English); S.H. Vosko, B. Eng., M.Sc., Ph.D., (Physics); J.T. Wilson, O.C., O.B.E., Ph.D., Sc.D., LL.D., P.R.S.C., F.R.S., (Physics).

Visiting Professor: K. Burke, B.Sc., Ph.D., (Geology).

Associate Professors: P.W. Ball, B.Sc., Ph.D., (Botany); T. Bloom, B.Sc., M.A., Ph.D., (Mathematics); J.V. Canfield, M.A., Ph.D., (Philosophy); C. Cloutier-Wojciechowska, L.èsL., M.A., D.E.S., D.de l'U., (French); F.I.M. Craik, B.Sc., Ph.D., (Psychology); S.M. Eddie, B.S., Ph.D., (Economics); L.J. Elmer, B.A., S.T.D., (Religious Studies); P.H.H. Fantham, M.A., Ph.D., (Mathematics); R.A. Fenn, B.A., M.Sc.(Econ.), Ph.D., (Political Science); D.H. Gorman, B.Sc., Ph.D., (Geology); R. Gregor, M.A., Ph.D., (Political Science); A. Guha, M.Sc., Ph.D., (Microbiology); B. Kovrig, M.A., Ph.D., (Political Science); J.E. LeBel, M.A., Ph.D., (Mathematics); G. Mazzotta, M.A., Ph.D., (Italian); G.F. McGuigan, M.A., Sc.Soc.D., (Economics); P.P.M. Meincke, B.Sc., M.A., Ph.D., (Physics); A. Mohr, A.B., Ph.D., (Anthropology); D.P. Morton, M.A., Ph.D., (History); G.A. Ozin, B.Sc., D.Phil., (Chemistry); F.W. Peers, B.Ed., M.A., Ph.D., (Political Science); P.J. Pointing, B.Sc.F., Ph.D., (Zoology); J.J. Rae, M.A., Ph.D., F.C.I.C., (Chemistry); E.A. Robinson, Ph.D., D.Sc., F.C.I.C., (Chemistry); B.A. Sigmon, B.A., M.S., Ph.D., (Anthropology); J. Skvorecky, Ph.D., (English); I.M. Spigel, M.A. Ph.D., (Psychology); I.W.J. Still, B.Sc., Ph.D., (Chemistry); S.M. Trott, B.Sc., M.A., Ph.D., (Mathematics); H.H. Weinberg, M.A., Ph.D., (French); S.S.M. Wong, M.S., Ph.D., (Physics).

Visiting Associate Professor: J.A. Hynes, A.B., (Economics).

Assistant Professors: T.H. Adamowski, M.A., Ph.D., (English); T.M. Alloway, M.A., M.S., Ph.D., (Psychology); D.F. Andrews, M.Sc., Ph.D., (Mathematics); H.F. Andrews, M.Sc., D.Phil. (Geography); R.L. Beck, M.A., Ph.D., (Classics); A.M. Bennett, M.A., (Sociology); K.R. Blankstein, M.A., Ph.D., (Psychology); C.T. Bolton, M.S., Ph.D., (Astronomy); H.J. Breslauer, M.A., M.Phil. (Sociology); C. Cassin, M.A., Ph.D., (Philosophy); C.H. Chastain, M.A., (Philosophy); R.F. Code, B.Sc., A.M., Ph.D., (Physics); B. Corman, A.M., Ph.D., (English); C. Corter, B.A., Ph.D., (Psychology); C.R. Crawford, M.A., Ph.D., (Mathematics); R.B. Day, M.A., Ph.D., (Political Science); V.A. De Luca, M.A., Ph.D., (English); D.J. Dunlop, M.A. Ph.D., (Physics); T.G. Elliott, B.A., Ph.D., (Classics); L.F. Felt, B.A., Ph.D., (Sociology); W.G. Filion, B.A., M.Sc., Ph.D., (Botany); P.R. Findlay, M.A., Ph.D., French); R.A. Frost, B.Sc., Ph.D., (Botany); W.T. Geilling, M.S., Ph.D., (Zoology); D.L. Gibo, B.A., Ph.D., (Zoology); R.C. Gunn, M.A.Sc., M.Sc., (Survey Science); M.J. Hare, B.Com., C.A., (Economics); O. Hegyi, M.A., Ph.D., (Spanish); D.B. Hill, Jr., M.A., Ph.D., (English); P.A. Horgen, B.A., M.S., Ph.D., (Botany); V. Jurdjevic, M.S., Ph.D., (Mathematics); J.B. Kervin, B.A., Ph.D., (Sociology); A.A. Kontos, M.A., Ph.D., (Political Science); L. Krames, M.A., Ph.D., (Psychology); W.D. Lakin, M.S., Ph.D., (Mathematics); D.I. Lancashire, M.A., Ph.D., (English); C. La Vigna, B.A., Ph.D., (History); P. Lorion, M.A., Ph.D., (Sociology); M. Mather, B.A., Ph.D., (Mathematics); H.E. McCandless, B.Com., C.A., M.B.A., (Commerce); F.J. Melbye, M.A., Ph.D., (Anthropology); W. Meyer-Erlach, M.A., Ph.D., (German); G.K. Morris, B.S.A., M.Sc., (Zoology); M. Moscovitch, B.Sc., M.A., Ph.D., (Psychology); J.C. Munday, A.B., Ph.D., (Geography); E.G. Neglia, M.A., Ph.D., (Spanish); D.H. O'Day, M.Sc., Ph.D., (Zoology); J.P. Payne, M.A.,

(German); J.R. Percy, B.Sc., M.A., Ph.D., (Astronomy); J. Pesando, M.A., Ph.D., (Economics); P.L. Pliner, B.S., Ph.D., (Psychology); D.L. Raby, B.A., Ph.D., (History); R. Racine, B.Sc., M.A., Ph.D., (Astronomy); P.V. Rangnekar, M.Sc., Ph.D., (Botany); S.A. Rea, A.B., Ph.D., (Economics); C.I. Reid, B.A., Ph.D., (Classics); L. Reinhardt, B.F.A., M.A., Ph.D., (Anthropology); R.M. Rosenbaum, M.A., (Psychology); A. Rosenthal, M.A., Ph.D., (Philosophy); R. Rower, M.A., Ph.D., (English); M. Scarth, M.A., (Spanish); M. Schiller, M.A., Ph.D., (Philosophy); N.N. Shneidman, M.A., M.P.H.E., Dip.R.E.E.S., Ph.D., (Slavic); J.C. Silver, B.S., Ph.D., (Microbiology); P.H. Solomon, M.A., (Political Science); M.W. Spencer, M.A., Ph.D., (Sociology); W.G. Sprules, B.Sc., M.A., Ph.D., (Zoology); G.I.A. Stegeman, M.Sc., Ph.D., (Physics); A.L. Stein, M.A., Ph.D., (French); F.D. Tall, A.B., Ph.D., (Mathematics); G.R. Thaler, M.Sc., Ph.D., (Botany); D.A. Trott, M.A., Ph.D., (French); R.M. Vanderburgh, M.A., (Anthropology); J.R. Webster, M.A., Ph.D., (Spanish); W.B. White, A.B., M.S., Ph.D., (History); M.A. Winnik, B.A., Ph.D., (Chemistry).

Visiting Assistant Professors: A. Donner, M.A., Ph.D., (Economics); H.C. Halls, M.Sc., Ph.D., (Physics); M. Moskovits, B.Sc., Ph.D., (Chemistry).

Lecturers: J.H. Astington, M.A., (English); A.R. Byrne, M.A., (Geography); G. Chesneau, C.A.P.E.S., D.E.S., (French); M. Dafoe, M.A., (History); P. Duckwork, M.A., (Geography); M.P. Ducretet, L.Philol., Rom., Agr.E.M.S., (French); G.H.K. Gad, D.Phil., (Geography); C.J. Houston, M.A., (Geography); R.E. Johnson, B.A., (History); U. Kareda, M.A., (English); K.A. Lantz, M.A., Ph.D., (Slavic); M. Levene, M.A., (English); P. Marchese, M.A., M.Phil., (Italian); L.T. McCormick, A.M., (Italian); T.F. McIlwraith, M.A., (Geography); R.R. McLeod, M.A., (English); J.K. Metzger, A.B., M.Sc., (Computer Science); J.C. Poë, A.R.S.C., D.I.C., M.Sc., (Chemistry); A.T.R. Powell, M.A., (Sociology); M.I. Raine, M.A., (French); A.I.F. Urquhart, M.A., (Philosophy).

Special Lecturers: W. Bauer, M.A., (German); M. Drillings, M.A., (Psychology); T.A. Heinrichs, M.A., (Political Science); D.W. Johnson, B.Sc., Ph.D., (Chemistry); M. Lavelle, M.A., (Religious Studies); S.A. Nigosian, M.A., (Religious Studies); L.L. Sample, A.B., Ph.D., (Anthropology); L.E. Schmidt, M.A., (Religious Studies); I. Scott, B.Sc., M.A., (Political Science).

Visiting Lecturer: W.S.F. Kidd, B.A., (Geology).

GENERAL INFORMATION

THE LIBRARY

The Library collection contains about 3,800,000 volumes, 800,000 microtexts, 100,000 maps, 7000 manuscript titles, and 310,000 other items. These figures include the holdings of the central University Library, more than forty-five libraries in colleges, faculties and departments of the University, and the libraries of federated, affiliated and related institutions.

Besides its extensive specialized services, the University Library administers several undergraduate collections on campus. The largest undergraduate collection, the Wallace Room, consists of over 120,000 volumes and has photocopy, typing and microform-reading equipment adjacent to the reading areas. Information concerning the use of the library is available in *the General Guide to the University of Toronto Library* and a series of other leaflets on various library services, supplemented by audio-visual programmes and special bibliographic seminars. Tours of the University Library are available to new students at the beginning of each academic session. Copies of the *Guide* are available at the "Circulation" and "Reference" counters of most libraries in the University.

The collections of the John P. Robarts Library, the humanities and social sciences research library which is under construction and due to be completed during 1973-74, will be available to all readers who have need of them.

RESIDENCE ACCOMMODATION

In addition to college residences, accommodation may be located at the following:

Devonshire House

Established in 1907 as a gift to the University, Devonshire House is a Hall of Residence for men. It is designed primarily for undergraduates in the professional faculties, but some Arts and Science men and graduate students are included among its members. The facilities of the Residence include common rooms, a library, a music room, games rooms, kitchenettes, a laundry room and a television room. Members take meals at any of the numerous eating places on or off the campus. The House is also open during the summer months. Requests for application forms and other inquiries should be directed to the Secretary to the Dean, Devonshire House, University of Toronto. (Telephone 928-2515).

Housing Service

To assist University students and staff who may not be accommodated in the residences or who choose to live off-campus, the Housing Service, 49 St. George Street (telephone 928-2542), maintains a registry of accommodation reported to it by householders. Inclusion in the registry does not necessarily imply inspection nor approval. As the accommodation is for immediate occupancy it cannot be reserved in advance.

Married Student Apartments

There is an apartment complex consisting of one and two bedroom units located near the University, which is available to students of the University. Applicants must be registered at the University either full-time or in a degree programme as a part-time student. Although the apartments were designed for married students some consideration may be given to single students. For further information and application, write University Housing Service, 49 St. George Street.

Campus Co-operative Residence

Campus Co-operative Residence Incorporated offers residence and apartment accommodation for graduate and undergraduate students. Since the University of Toronto has no official connection with this organization, enquiries should be directed to: Campus Co-operative Residence Incorporated, 395 Huron Street, Toronto M5S 2G5, Ontario (Telephone 964-1961).

HART HOUSE

All full-time University of Toronto students are members of Hart House. Membership covers a wide variety of activities including concerts, debates, poetry readings and art exhibitions. Students are

welcome to use the many rooms as well as the Farm in the Caledon Hills. The House is open from 7:00 a.m. to midnight every day of the year.

Food services are available from 8:00 a.m. to 11:30 p.m.: full-course meals in the Great Hall, table-service in the fully-licensed Gallery Dining Room, a coffee-shop and Pub in the Arbor Room and Tuck Shop. For further information about Hart House telephone 928-5361.

UNIVERSITY HEALTH SERVICE

Medical examination by the Health Service is recommended for all students participating in competitive athletics.

Vaccination, Tetanus Toxoid and Salk Polio Vaccine are recommended at five-year intervals.

Tuberculin Testing or Chest X-ray is recommended for all students at intervals of four to five years.

Medical, psychological, athletic injury and infirmary services are available at the University.

SUMMARY OF REGULATIONS OF THE CAPUT CONCERNING STUDENT DISCIPLINE

Subject to the general regulations of the Caput of the University regarding jurisdiction in matters of discipline, the Council of University College, the governing bodies of the Federated Universities and Affiliated Colleges, and the Councils of the Faculties, Schools, and Institutions have disciplinary jurisdiction over the conduct of all students registered in these Divisions of the University in all matters of local or internal concern to the Divisions. Jurisdiction over the conduct of students while in residence regardless of the Division of the University in which they are registered is vested in the body administering the residence.

Where the appropriate body exercising disciplinary jurisdiction has found that a student of the University has engaged in conduct prejudicial to the interests of the University, the Caput may, in its discretion, suspend or expel such student from the academic privileges of the University. Every decision of the Caput involving the expulsion of a student from the University requires confirmation of the Governing Council.

The constitution of every society or association of students in the University and all amendments to such constitutions require to be approved by the relevant University authorities. The giving of approval, and the responsibility for the programmes of student societies and associations, shall rest as follows:

- (1) With the authorities of the College, Faculty or School concerned where the membership of the student society or association is drawn from a single College, Faculty or School.
- (2) With the Board of Stewards of Hart House, where the student society or association is a Committee of Hart House and is controlled by the Board of Stewards of Hart House.
- (3) With the Caput, in the case of all other student societies and associations.

CHRONOLOGY

- 1827 — Royal Charter granted to establish King's College at York (Toronto).
- 1836 — Upper Canada Academy founded at Cobourg, Ont. Became Victoria College in 1841.
- 1843 — Official Opening of King's College, located in former Parliament Buildings of Province of Upper Canada.
- 1849 — King's College became University of Toronto. Connection with Church of England terminated.
- 1851 — Trinity College established.
- 1852 — St. Michael's College founded.
- 1853 — University College established, assuming responsibility for all teaching in the University.
- 1856 — Construction of present University College building started. Completed 1859.
- 1881 — St. Michael's College affiliated with University. Full federation effected 1910.
- 1887 — Instruction begun in fields other than Arts and the Sciences. University College became purely an Arts College.
- 1890 — East section of University College building, including University Library, gutted by fire. Immediately reconstructed.
- 1890 — Victoria College federated with University of Toronto.
- 1892 — Victoria College moved to Toronto from Cobourg.
- 1892 — University Library opened—enlarged 1909 and 1954.
- 1904 — Trinity College federated with University of Toronto.
- 1905 — Part-time courses leading to the B.A. degree were established.
- 1920 — The Department (now Division) of University Extension was organized.
- 1920 — Degree of Bachelor of Commerce established.
- 1925 — Trinity College moved to present buildings from old Queen Street site.
- 1931 — Ontario Upper School (Grade 13) standing required for admission.
- 1960 — Name of Faculty changed to "Faculty of Arts and Science".
- 1961 — Degree of Bachelor of Science established.
- 1962 — New College established.
- 1964 — Innis College established.
- 1965 — Scarborough College opened.
- 1967 — Erindale College opened.
- 1969 — New Programme instituted in the Faculty of Arts and Science.

INDEX

- Academic Records 21
 Accounting 82
 Actuarial Science 37,50
 Admission 11
 Advanced Standing 11,48
 Aegrotat Consideration 19
 Akkadian 31,216
 Anatomy (ANA) 51,325
 Annual Examinations 20
 Anthropology (ANT) 16,51,315
 Application and Admission 11
 Application Fee 12
 Applied Mathematics 58
 Applied Science and Engineering 60,71,79,
 104,164,207,315
 Arabic 31,181,182,183,184
 Aramaic 31,216
 Archaeology 51
 Assyriology 32
 Astronomy (AST) 37,60,315
 Astrophysics 37
 Attendance and Examinations 20
 August Examinations 20

 B.A. Programmes 25
 Bachelor of Arts 4,16,17,25
 Bachelor of Commerce 4,17,43
 Bachelor of Science 4,16,17,36
 B.Com. Programme 17,43
 Biochemistry (BCH) 37,38,62,325
 Biochemistry and Chemistry 38
 Biology (BIO) 37,39,64
 Biology and Mathematics 39
 Botany (BOT) 37,64,65,315
 B.Sc. Programmes 36

 Campus Co-operative Residence 335
 Canada Student Loans 13
 Caput 336
 Change of Course 2,3,14
 Checking of Marks 12,21
 Chemical Engineering (CHE) 71,315
 Chemical Physics 37
 Chemistry (CHM) 37,38,40,72,315
 Chemistry and Biochemistry 38
 Chemistry and Mathematics 40
 Chemistry (with Physics) 38
 Chinese Studies 25,31,91
 Chronology 337
 Cinema 24,168,174
 Civil Engineering (CIV) 79,315

 Classics 25,28,29,80,144,145,148,192,315
 Clinical Biochemistry (CLB) 81,325
 Colleges 5,14
 Commerce (COM) 17,43,81,328
 Commerce and Finance 17,43
 Communications 175
 Computer Science (CSC) 38,86,317
 Confirmation of Programme 13,14
 Counselling 22
 Courses of Instruction 49
 Credit 16,19
 Czech 31,286,287,290

 Data Management 38
 Degrees 21
 Dentistry 24,47
 Departments of the Faculty 49
 Devonshire House 335
 Discipline 336

 East Asian Studies 25,30,90,318
 Economics 26,40,95,329
 Economics and Mathematics 40
 Education 47,166
 Egyptian 25,31,32,216
 Electrical Engineering (ELE) 104,315
 English 26,31,105,318
 English and Latin 27,31
 English and One Other Subject 26
 Enrolment 14
 Entry into a Fourth Year Programme 16
 Environmental Studies 23,175
 Erindale College 5,9,14,22,333
 Ethics 230,327
 Evening Classes 10,11
 Examinations 12,20
 Extension, Division of University 5,10,
 14,15
 Extra Courses 3,16

 Faculty of Arts and Science 5,14,314
 Faculty Officers 314
 Fees 12
 Film Studies 24
 Fine Art (FAR) 27,113,319
 First Year Programme 16,20,43
 Fourth Year Programme 16,17,20,44
 French(FRE) 27,31,119,320
 French and Another Subject 28
 French and Latin 28,31
 French Language and Literature 27

- General Information 335
 General Regulations for Standing 19
 Geography (GGR) 16,28,131,321
 Geology (GLG) 39,41,139,322
 German (GER) 28,31,128,322
 German Language and Literature 28
 Greek (GRK) 25,28,31,216,148
 Greek and Another Subject 29
 Greek and Latin Literature in Translation (GLL) 144
 Greek and Roman History (GRH) 29,145
 Hart House 335
 Health Service 336
 Hebrew 31,33,216
 Hellenistic Studies 33,216
 Hindi 31,282
 Hispanic Studies 5,23,260,299,324
 History (HIS) 29,150,322
 History and Philosophy of Science and Technology (HPS) 163,323
 History of Art 27
 How to Read the Calendar 4
 Housing Service 335
 Humanities 23,25
 Hygiene 41,205,263,323
 Important Notices 3,4,
 Independent Studies 122,167,171
 Indian Studies 35,281,331
 Industrial Engineering (IND) 164,315
 Innis College 5,8,14,22
 Innis College Courses (INI) 166
 Interdisciplinary Literature Courses (INL) 12,168
 Interdisciplinary Studies (INX) 12,22,174
 Islamic Studies (ISL) 29,179,324
 Italian Studies (ITA) 29,31,184,324
 Italian and Another Subject 30
 Italian and Hispanic Studies 324
 Italian and Latin 31
 Japanese Studies 30,31,91
 Jewish Studies 30,46
 Joint Courses 189
 Key to Course Descriptions — Inside front cover
 Languages and Literatures 25,31
 Late Confirmation of Programme 13
 Late Payment 13
 Late Registration 2,13,14
 Latin (LAT) 25,27,28,31,192
 Latin American Studies 31
 Latin and Another Subject 31
 Law 47
 Library 335
 Library Science 47
 Linguistic Anthropology 52
 Linguistics 31,32,40,195,324
 Linguistics and Mathematics 40
 Literature 23,25,168
 Management Studies 47
 Marathi 31,285
 Married Student Apartments 335
 Mathematical Physics 41
 Mathematical Studies 39
 Mathematics 24,39,40,41,50,58,197, 305,324
 Mathematics and Biology 39
 Mathematics and Chemistry 40
 Mathematics and Economics 40
 Mathematics and Linguistics 40
 Mathematics and Philosophy 40
 Mathematics for Teaching 40
 Medicine 24,37,41,47,51,81,205,220, 261,325
 Metallurgy and Materials Science (MMS) 207
 Microbiology (MBL) 41,205,323
 Modern History (HIS) 29
 Modern Languages and Literatures 32
 Modernization and Community 176
 Mohawk 31
 Music (MUS) 32,208,326
 Natural Sciences 24
 Near Eastern Studies (NES) 32,214,326
 New College 5,8,14,22,319,320
 Non-Matriculants 11
 Officers of the University 314
 Ontario Grade 13 Applicants 11
 Ontario Student Awards 13
 Other Fees 12
 Outside Centre Fee 12
 Outstanding Fees 13
 Palestine 33
 Pali 31,283
 Parasitology 263,323
 Part-time Students 10,15
 Paying by Instalments 12,13
 Penalties 3,13
 Persian 31,181,183
 Pharmacology (PCL) 220,325

- Philosophy (PHL) 33,40,228,327
 Philosophy (SMC) (PHI) 34,221,327
 Philosophy and Biology 33
 Philosophy and Greek 29
 Philosophy and Mathematics 40
 Philosophy and Physics 34
 Physical Anthropology 52
 Physical and Health Education (PHE)
 220,328
 Physics 37,38,41,240,328
 Physics with Astronomy 37
 Physics with Chemistry 37
 Physics and Geology 41
 Physics and Mathematics 41
 Physics and Philosophy 34
 Physiology (PSL) 41,42,261,326
 Plagiarism 21
 Polish 287,288,290,291
 Political Economy 26,34,95,251,328
 Political Science 34,251,329
 Portuguese 31,260
 Preparation for Study in Professional
 Faculties 24,47
 Probation 18
 Programme in Arts and Science 22
 Psychology (PSY) 41,264,330
 Psychology and Physiology 42

 Quebec 172,173

 Rechecking Marks 12,21
 Refused Registration in the Faculty 18
 Registration and Enrolment 14
 Regulations Concerning Discipline 336
 Religious Studies (REL) 34,272,330,
 Requirements for a Four-Year Degree 17
 Requirements for Standing 16
 Requirements for Three-Year Degree 16
 Residence Accommodation 335
 Russian 31,286,287,288,289,290,291,292
 Russian Language and Literature 35

 St. George Campus 6,43
 St. Michael's College 5,7,14,22,221,317,
 319,321,322,327,331
 St. Michael's College Courses (INM) 170
 Sanskrit and Indian Studies (SIS) 13,34,
 281,331
 Scarborough College 5,10,14,22
 Schedule of Dates 2,3
 Second Year Programme 16,43
 Serbo-Croatian 31,287,288,290
 Slavic Languages and Literatures (SLA)
 34,285,331

 Slavonic 31,289
 Slovak 31
 Social and Cultural Anthropology 52
 Social and Economic Policy 44
 Social Sciences 23
 Social Work 47
 Sociology (SOC) 292,331
 Spanish Studies (SPA) 31,36,299,324
 Spanish and Another Subject 36
 Spanish and Latin 31
 Special Examination Fee 12
 Special Students 12,14,15,20
 Standing in a Course 19
 Statistics (STA) 305
 Studio, Fine Art 27
 Study Elsewhere 12,44
 Sutism 182,183
 Suggested Programmes of Study 25
 Summer Sessions 2,3,10
 Supplemental Examinations 12,20
 Suspension 18
 Syriac 33,216

 Teaching Staff 315
 Term Work 2,3,20
 Third Year Programme 16,20,44,45
 Transcripts 12,15,21
 Trinity College 5,7,14,22,317,319,321,
 322,327,330
 Trinity College Couress (INT) 170
 Turkish 31,181,183
 Type A Certification 47

 Ukrainian 31,287,288,290,291
 University and Faculty Officers 314
 University College 5,6,14,22,317,318,320,
 322,326,327
 University College Courses (UNI) 172
 University Extension, Division of 5,10,
 14,15
 University Health Service 336

 Victoria College 5,6,14,22,317,319,320,
 322,326,327,330
 Victoria College Courses (INV) 173

 Withdrawal 2,3,14
 Women 178

 Yiddish 31,56

 Zoology (ZOO) 37,42,64,306,332

The University of Toronto issues the following calendars and other publications concerning courses of instruction given by the University. Requests for calendars or information may be directed to the Office of Admissions of the University or to the Secretary of the particular Faculty, School or Institute.

ADMISSION INFORMATION—	Admission Awards Undergraduate Admission Handbook Undergraduate Admission Bulletin
APPLIED SCIENCE AND ENGINEERING—	Faculty of Applied Science and Engineering Engineering at Toronto—descriptive brochure
ARCHITECTURE—	Faculty of Architecture, Urban and Regional Planning and Landscape Architecture
ARTS AND SCIENCE—	Faculty of Arts and Science— St. George Campus Scarborough College Calendar Erindale College Calendar
CHILD STUDY—	Institute of Child Study, Faculty of Education
DENTISTRY—	Faculty of Dentistry Division of Postgraduate Dental Education Division of Dental Hygiene
EDUCATION—	Faculty of Education Bachelor of Education in Extension Graduate Degrees in Education*
EXTENSION—	Degree Programmes in Extension Diploma and Certificate Programmes in Extension Pre-University Courses Continuing Education Programme (Special Programmes)
FOOD SCIENCES—	Faculty of Food Sciences
FORESTRY—	Faculty of Forestry
GRADUATE STUDIES—	School of Graduate Studies
HYGIENE—	School of Hygiene
LAW—	Faculty of Law
LIBRARY SCIENCE—	Faculty of Library Science
MANAGEMENT STUDIES—	Faculty of Management Studies
MEDICINE—	Faculty of Medicine, Medical Course Department of Rehabilitation Medicine Division of Postgraduate Medical Education
MUSIC—	Faculty of Music Royal Conservatory of Music Year Book
NURSING—	Faculty of Nursing
PHARMACY—	Faculty of Pharmacy
PHYSICAL AND HEALTH EDUCATION—	School of Physical and Health Education
SOCIAL WORK—	Faculty of Social Work

*Write to: Ontario Institute for Studies in Education, 252 Bloor Street West, Toronto, Ontario, M5S 1V6.

